THE AAO
JOURNAL
A Publication of the American Academy of Osteopathy

TRADITION SHAPES THE FUTURE • VOLUME 10 NUMBER 1 SPRING 2000

Visceral Biodynamics

August 4-6, 2000
San Francisco, CA

Program Chairman: Kenneth Lossing, DO

Christina Williame, DO and George Finet, DO, of Belgium, have been doing research on the movements of the abdominal viscera with respiration, for 15 years. The hollow organs were studied with barium and fluoroscopy; the solid organs were studied with echo. Non symptomatic and symptomatic patients were compared to find if there was a reproducible normal axis of movement, it's amplitude, and how dysfunction affected it. These studies are the basis for their unique palpatory diagnosis and manipulative treatments.

I attended the first course they ever taught in English, last spring in Norway. I was so impressed with the amount I was able to learn, and apply in my practice, that I have invited them to come to San Francisco in August to teach their course for the first time in the USA. This is a "hands on" practical course, suitable as a first visceral course, or an advanced course.

Please come and join us.

Location:

Warick Regis Hotel, San Francisco (415) 928-7900.
$145/night, (Lossing group). 8:30 -5 each day, lunch not included.

Fee:

Practicing physicians $595, students, interns, and residents $495. Full payment required for registration. Course limit of 30 participants

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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

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.

Permissions
Obtain written permission from the publisher and author to use previously published illustrations and submit these letters with the manuscript. You also must obtain written permission from patients to use their photos if there is a possibility that they might be identified. In the case of children, permission must be obtained from a parent or guardian.

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.

Editorial Processing
All accepted articles are subject to copy editing. Authors are responsible for all statements, including changes made by the manuscript editor. No material may be reprinted from *The AAO Journal* without the written permission of the editor and the author(s).

From the Editor

by Anthony G. Chila, DO, FAAO

Thank you, Doctor Hruby

Involvement in the activities of the American Academy of Osteopathy often provides opportunities for relationships between individuals which show parallels and interrelationships of careers. I would like to describe one of many which I have enjoyed over the past 30 years.

I was first introduced to Raymond J. Hruby, DO, when he was associated with William E. Wyatt, DO at the former Osteopathic Hospital of Maine, Portland, ME. Both physicians were involved in the conduct of the hospital-based Service of Osteopathic Medicine. At that time, 1981-82, I was beginning my Adjunct Faculty relationship with UNECOM, initiated by Doctor Wyatt. As our acquaintance developed, Ray told me of his interest in pursuing Fellowship in the American Academy of Osteopathy. In 1983, during the AAO National Convention Program at New Orleans, LA, I was privileged to serve as his sponsor when he was conferred status as a Fellow in the American Academy of Osteopathy. He then became Raymond J. Hruby, DO, FAAO. I had just assumed the Office of President of the AAO, and by the end of that term (1983-84), had received approval from the AAO Board of Trustees to implement an ad hoc Long Range Planning Committee. I was also given the responsibility of chairing that committee. Ray was one of my original appointees. He became one of several AAO presidents to emerge from that committee, serving in office 1990-91. We then had the opportunity to work together in the reconstitution of two areas of credentialing: AOA board certification (AOBSPOMM) and the AAO Committee on Fellowship. In the intervening years, our friendship has continued to evolve. I now find myself following Ray in the Editor's role for *The AAO Journal*. This is an entirely new responsibility in which I will seek to build on the excellent foundation which he established. Thank you, Doctor Hruby.

Beginning with this issue, you will notice the addition of a byline to the Journal's masthead. As the osteopathic profession moves into a new century of health care, it seems appropriate to view our heritage and our role by asserting that Tradition Shapes the Future. In following Doctor Still's admonition to "Dig On", we can continue to demonstrate distinctiveness in the panorama of medical philosophies currently available to the general public. The challenge to "Dig On" was also addressed in 1927, within the decade following Doctor Still's passing. The thoughtful assessment provided then by Leon E. Page, DO is the basis for the archival selection. A research emphasis will be noted in this issue. Original papers appearing in the Peer-Reviewed Section describe the research activity of the osteopathic profession since 1940 (Beal); a pilot study of brain wave changes in childhood ADD/ADHD following OMT (Blood and Hurwitz); and a retrospective study of lift therapy in Naval personnel (Lipton et al.). The definition of Peer Review in *The AAO Journal* is being expanded to include AOBNMM and FAAO Case Histories and Book Reviews. This will provide proper recognition of the level of academic responsibility associated with preparation of these categories.

Your comments and suggestions regarding continuing improvement of *The AAO Journal* are always welcome.

Message from the President

by Mark S. Cantieri, DO, FAAO

A Time of Reflection

It is time to be reflective as I bring to you my last letter as president of the American Academy of Osteopathy. What I have enjoyed the most have been my interactions with the staff of the American Academy of Osteopathy. Their professionalism and support have made this year go by rapidly and with a minimal amount of anxieties. The original decision to make Mr. Steve Noone our executive director continues to have proven to be very wise. One of the most important things he brings to his position is a historical perspective of the AAO and AOA and the ability to rapidly retrieve documents from his archives relevant to issues between our two organizations. This fact-finding ability has greatly aided us on more than one occasion over the last year. My compliments also go to the rest of the staff of the AAO for bringing us the JAAO, handling membership and educational issues, as well as the day-to-day operations of our Academy.

Many goals lie ahead for the Academy. We need to continue to bring quality educational programs to our members which are cutting edge in nature. We can not afford to become stagnant and only recycle information. I feel confident that Dr. Eileen DiGiovanna and the Education Committee will be able to improve an already excellent and diverse set of the educational programs.

Currently we are also looking at our organizational government structure. I would like to see the elimination of the Board of Governors and an expansion of the Board of Trustees. I would also like to see a way to better utilize the past presidents. When one becomes the immediate past president there is minimal utilization of the knowledge and insights that individual has gained during their term. I feel this is a waste of valuable resources. The Gavel Club, which is made up of past presidents, is a source of knowledge that could be better utilized. This year I began having all Board of Trustees information sent to the past presidents for their review and comments prior to the board's meeting. This is only one example of how this resource could be better utilized.

On multiple occasions this year I have encouraged Dr. Marcelino Oliva to appoint an Academy member to the Federal Health Council. Approximately 20 percent of the graduates of the Fellowship Program in Health Policy are Academy members, an obvious reflection of our membership's interest in the policy and politics of medicine. We need to continue to advocate for a position on the council because of the special insights we can bring to the table.

The AOA has an OPTI Committee, as does the Academy. Last year I moved for the dissolution of the Hospital Assistance Committee and the initiation of an OPTI Committee. We are currently working to find the appropriate chair for this committee and to get the chair appointed to the AOA OPTI Committee as well. The OPTI Committee needs to establish an examination taken over the Internet that tests osteopathic principles for every clinical rotation. The colleges also need to have the third and fourth year students return at least every six months for practical OMM examinations. Only by having a voice on this committee can these goals being achieved. I also hope to push for this requirement from my position on the Council of Predoctoral Training.

We are also very likely to see continued growth in our graduates going to ACGME programs for their postdoctoral training. During the last match only 60 percent of D.O. graduates even participated in the AOA match. There is also a shortage of AOA funded internship slots that numbers approximately six hundred short of the number of current graduates. As our number of graduates continues to grow this shortage will also. This will mean that the AOA needs to have ACGME programs approved for osteopathic postdoctoral training. Within that training must be necessary requirements in osteopathic principles and practice.

The OPTI will need to be able to provide these. If not, the Academy already has created educational programs available for this area of need.

Finally, I hope to see the American Osteopathic Board of Neuromusculoskeletal Medicine include new individuals with diverse backgrounds. Our new board requires additional education in the fields of orthopaedics, rehabilitation, occupational medicine, anesthesiology / pain management and physical medicine, as well as the previous osteopathic manipulative treatment. This board must reflect this type of knowledge base and experience to effectively create a fair and high quality examination.

I look forward to seeing you in Cleveland.❐

Message from the Executive Director

by Stephen J. Noone, CAE

Research on OPP/OMT is Critical to the Profession's Future

The Mission of the American Osteopathic Association includes a provision *to preserve osteopathic principles and practice* (OPP), thus ensuring access to osteopathic physicians for patients who seek management of their health care within this separate yet distinct mainstream medical profession. In both its Mission Statement and current strategic plan, the American Academy of Osteopathy (AAO) places a high priority on promoting ongoing research to explore indications, outcomes, efficacy, and applications of OPP and osteopathic manipulative treatment (OMT).

While the osteopathic medical profession is over 100 years old, doctors of osteopathy (DOs) have predominantly devoted their professional lives to clinical practice rather than to research and academia. From the perspective of today's "evidence-based medicine," one outcome of the profession's focus on patient care is the relative lack of scientific research on the clinical efficacy and outcomes of the practice of osteopathic medicine, particularly studies dealing with the integration of OPP/OMT in total health care. However, the publication of the AOA's low back pain study in the November issue of the *New England Journal of Medicine*[i] may well serve as a catalyst to advance the profession's research agenda.

The evolution of technology and electronics offers the osteopathic medical profession attractive mechanisms which can facilitate research studies on osteopathic medical practice and promote wider participation on the part of DOs in active clinical practice. The AAO's Louisa Burns Osteopathic Research Committee (LBORC) has already created and validated a paper version of the *Outpatient Osteopathic SOAP Note Form* which documents both uniquely-osteopathic as well as standard medical elements of the physician-patient encounter.[ii]

The LBORC has now embarked on an ambitious project to convert the *Outpatient Osteopathic SOAP Note Form* to an electronic version for placement on the Internet and for use in DOs' offices to record relevant patient data beginning March 2001. Physicians will be able to send this data over the Internet to a secure Web site which will serve as the National Osteopathic Clinical Database at Nova Southeastern University College of Osteopathic Medicine. Researchers ultimately will be able to access this aggregate patient data for testing their hypotheses on the effect of OPP/OMT in patient care. The LBORC has consulted with other osteopathic organizations in the development of this project, including the American Osteopathic Association, the American Association of Colleges of Osteopathic Medicine and the American Osteopathic College of Family Physicians.

In 1996, the Josiah Macy, Jr. Foundation convened the second of two conferences to promote interaction and improved communication between the osteopathic and allopathic medical professions.[iii] Among the recommendations of this second conference was the challenge "to develop jointly a research agenda to investigate the efficacy of OMT in conditions in which documentation is lacking." The Academy believes that the development of the electronic *Outpatient Osteopathic SOAP Note Form* will serve as a catalyst for the advancement of this research agenda.

The economic bottom line for the osteopathic medical profession is the recognition of increased negative pressures which discourage the delivery of OPP/OMT in patient care. Third party payors deny reimbursement for OMT, citing the lack of scientific studies which document its medical necessity and/or efficacy. Health maintenance organizations deny DOs reimbursement for OMT, citing reliance on an allopathic practice model and need to increase the volume of patients served by the physician on any given day. The Academy believes that the development of the National Osteopathic Clinical Database and advancement of the profession's research agenda will demonstrate the cost-effectiveness of osteopathic medical practice. When researchers publish such documentation in the medical literature, the profession's leaders will have credible, scientific evidence to advocate for appropriate utilization and reimbursement for OPP/OMT.

In addition to its application for research, an electronic version of the *Outpatient Osteopathic SOAP Note Form* →

and a National Osteopathic Clinical Database could serve as a tool for Osteopathic Postdoctoral Training Institutes in tracking the integration of osteopathic principles and practice and osteopathic manipulative treatment on the part of medical students, interns and residents. The osteopathic medical profession could use the electronic *Outpatient Osteopathic SOAP Note Form* as a foundation from which to build practice guidelines unique to the profession. In their individual offices, DOs could use this osteopathic electronic medical record both to improve patient care and business management.

[i]Anderson GBJ, Lucente T, Davis AM, Kappler RE, Lipton JA, Leurgans S; A comparison of osteopathic spinal manipulation with standard care for patients with low back pain. N Engl J Med 1999;341:1426-31.

[ii]Sleszynski SL, Glonek T, Kuchera WA, Standardized Medical Record: A New Outpatient Osteopathic SOAP Note Form: Validation of a Standardized office form against physician's progress notes, JAOA 1999;99:516-529

[iii]Sirica CM, editor, Current Challenges to M.D.s and D.O.s: Proceedings of a Conference Chaired by D. Kay Clawson, M.D., New York, Josiah Macy, Jr. Foundation, 1996.❒

Affiliated Organization's CME Calendar...

April 8-9
Fifth Annual Family Practice Review and Reunion
Dept. of Medical Education and the Family Practice Residency Program
Grandview Hospital/Medical Center
Hours: 11 Category 1A (applied for)
Dayton, OH
Contact: Jennifer Horvath
(937) 222-4213

April 28-30
50th Anniversary / Annual Convention
Florida Academy of Osteopathy
Hours: 20 Category 1A
Crystal River, FL
Contact: Dr. Kenneth Webster
(727) 581-9069

May 3-6
93nd Annual Clinical Assembly & Scientific Seminar
Pennsylvania Osteopathic Medical Assn
Hours: 40 Category 1A anticipated
Philadelphia, PA
Contact: Mario Lanni, Exec. Dir.
POMA
(717) 939-9318

May 4-7
103rd Annual Convention
Indiana Osteopathic Association
Hours: 30 Category 1A
Indianapolis, IN
Contact: Michael Claphan, CAE
(317) 926-3009

May 5-7
NeuroFascial Release Conference, a new paradigm in osteopathic thought
Arizona Academy of Osteopathy
Stephen M. Davidson, DO
Contact: Stephen Davidson, DO
(800) 359-7772

May 18-22
Basic Course
"Osteopathy in the Cranial Field"
Sutherland Cranial Teaching Foundation
Hours: 40 Category 1A
San Diego, CA
Contact: Judy Staser
(817) 926-7705

May 26-28
The Fundamentals of Cranial Osteopathy for Undergraduates
Joseph S. Grasso, DO
Hours: 18 Category 1A
Orlando, FL
Contact: Joseph Grasso, DO
(407) 380-8863

June 8-11
OMT With a View:
Pain Management by the Sea
Osteopathic Physicians & Surgeons of California
Hours: 20 Category 1A
Dana Point, CA
Contact: OPSofC
(916) 561-0224

June 15-18
101st Annual Convention & Scientific Seminar
Texas Osteopathic Medical Assn
Corpus Christi, TX
Contact: Mary Waggoner, TOMA
(800) 444-8662

June 17-21
Basic Course
The Cranial Academy
PCOM
Philadelphia, PA
Hours: 40 Category 1A
Contact: The Cranial Academy
(317) 594-0411

June 22-25
Annual Conference
The Cranial Academy
Philadelphia, PA
Contact: The Cranial Academy
(317) 594-0411

August 4-6
Visceral Biodynamics
Kenneth Lossing, DO
San Francisco, CA
Hours: 24 Category 1A
Contact: Kenneth Lossing, DO
(707) 766-8902

Why Mary is Smiling

Mary Philanthropist decided to give $10,000 to the major fund drive of her favorite charity. But first, she donned her gift-planning hat.

She remembered that, usually, it's better to donate appreciated stock than to write a check for the same amount. Locating a recent statement from her stockbroker, she reviewed her list of holdings. She noted that her stock in OPQ Corp. was valued at $100 per share. Checking the evening paper, she found that the stock was still trading at that price.

Years ago, Mary purchased 1,000 shares of OPQ stock at $10 per share. Since then, the stock has appreciated remarkably to where her investment has increased to $100 per share, with a current value of $100,000.

She considered her options. If she sold 100 shares of the stock, she would have $10,000, less the sales commission, to give the charity. However, at tax time, she would owe capital gains tax on the growth portion of the stock, the appreciation amount. Since the 100 shares had a cost basis of $1,000, the taxable amount would equal $9,000. Applying a capital gains tax rate of twenty percent to the $9,000, she calculated a tax bill of $1,800.

Now it's possible she may be able to offset this tax with the charitable deduction resulting from her gift. But, then, the deduction would not be available to offset other taxable income.

A smile emerged. She took pleasure reminding herself that, instead of selling the stock, she could instruct her broker to transfer 100 shares directly to the charity's account. Then, because the charity is a qualified charitable organization, it could sell the stock without any tax on the gain. And what's more, she would receive a charitable tax deduction for the full fair market value of the stock.

If she sold the stock and gave the cash, she'd receive only the one benefit of the charitable tax deduction. But if she gave the stock directly to the charity, she'd receive two benefits: the charitable tax deduction and the bypass of capital gains.

When she discussed the idea with her accountant, he affirmed her prudence and, knowing her healthy financial condition, encouraged her to proceed. He also reminded her that the charitable tax deduction of $10,000 could only be applied against 30 percent of her adjusted gross income, whereas a cash gift had a deductibility ceiling of 50 percent. However, if she wasn't able to use all of the deduction in one tax year, she could carry forward the unused portion into the next year, up to five years.

Mary called the charity's planned giving department and told them of her intentions. The charity did not have an account with her broker, but the planned giving officer said he would call the broker and arrange for a temporary account so the stock could be moved from her account to the charity's account. Once the transfer occurred, the charity would instruct the broker to sell the stock and mail a check, less the commission, to the charity.

The planned giving officer suggested to Mary that she write out her giving instructions (including signature and date) and mail them to her broker, with a copy to the charity. That's all she needed to do. Simple.

Once Mary made the gift, the broker sent a written confirmation to the charity indicating that the stock had been transferred and that the broker was holding it as agent for the charity, awaiting selling instructions.

What about you? Do you have appreciated assets such as stocks and bonds that could make a tax-wise gift? Did you have to pay significant capital gains taxes in 1999? You might plan ahead now for the 2000 tax year and consider this option to avoid the captial gains tax while enjoying the benefits of a deductible charitable contribution to the American Academy of Osteopathy.

If you want further information, please fill out and mail the form below. Or call AAO Executive Director Steve Noone at (317) 879-1881.❐

(Please complete and return this reply form.)

Dear Friends at the AAO:

___ Please send me information about giving stock.

___ Please send me information about giving real estate.

___ Please contact me personally about a possible gift.

Name:_____

Address:_____

_____

City:_____

State:_____ Zip:_____

Phone:_____

Mail this form to:
American Academy of Osteopathy,
3500 DePauw Blvd., Suite 1080,
Indianapolis, IN 46236-1136.

Advancing Osteopathic Medicine in Health Care:[1]

Integrating OMM into Osteopathic Medical Practice

by Deborah M. Heath, DO and Albert F. Kelso, PhD

The initial article in this series addressed the challenge of osteopathic medicine in the next millennium.[2] Formulation of a management plan for organizational change in meeting this challenge accomplishes and maintains the osteopathic health care mission. A successful change depends upon establishing, first, an integrated educational program for doctoral, post-doctoral and continuing education of physicians and, second, applied clinical research programs to provide evidence-based data on patients' health and illness, and an equal focus on including advances in medical practice. The student and practicing physicians need the knowledge, skills and experience and an opportunity to understand and treat the whole patient.

Osteopathic history indicates that patient support for the profession stemmed from the health outcomes quality health care includes a focus on the role of the somatic system in health benefits received from care provided by founders of the osteopathic profession.[3] Patients' testimonials ensured surviving state legislative challenges during the development of osteopathy in the United States. However, patient testimonials in the twentieth century must be documented as patient satisfaction, improved health status, and effectiveness in managing a patient's health problems.[4] A strategic management plan to accomplish the delivery of quality osteopathic care and document change in patients' health status can create an image at the forefront of health when it is implemented and controlled, anticipating future challenges in health and cost effective health care for patients.

An ad hoc committee of the American College of Physicians responded to public and governmental efforts to provide quality health care as early as 1980[5] (see preface). Attention to cost effectiveness received attention much later.[6] Public interest in modern medicine is evident in the media and leading medical publications. A recent publication in orthopedic medicine documents, with evidence-based data, the functional and other health care outcomes obtained in managing musculoskeletal disorders.[7] Unfortunately, management of manual medicine, other than a few references in the field of medicine, gives little attention to documenting health and cost effectiveness. Publishing guidelines for procedures and providing evidence-based data to support osteopathic practice advances osteopathic medicine to the forefront of health care practice. Osteopathic medicine's heritage is in danger of being lost[8] because our present trend in education and practice emphasizes medical practice and places little or no emphasis on restoring and maintaining neuromusculoskeletal system functions[9,10] and its relationship to health.

Strategic plans, to manage continual change in businesses and professions, address need, resources and management to be considered in providing a product or service. Models developed in business management over the past twenty-five years provide a framework for a health care strategic management model. Planning, implementing and controlling the integration of manual medicine and associated neuromusculoskeletal knowledge into physician education insures that our future health care system meets challenges requiring change in management. Implementing and monitoring the application of the plan creates and maintains a modern osteopathic medicine practice.

A clearly stated mission for the osteopathic profession is essential to planning continuing change in management. Does our present mission statement indicate that osteopathic health care provides equal attention to general and specific health problems?[11] The present mission statement needs to be reviewed to insure that it reflects our heritage and it's importance in current health care. A change in osteopathic management of health care delivery includes publishing guidelines for health assessment procedures and measuring health care effectiveness. The elements of an osteopathic health care plan need to address our historical foundation, improving the health of patients. This should include research on effectiveness of manual treatments (interventions) used in general, specific or adjunctive health care.

Modifying patients' specific medical problems is the main focus of the government, public and patients' expectations for effective health care at an affordable price. (see reference 4) This view overlooks the contribution made to recovery from illness, accidents and disease that is an adjunct accruing from an improvement in total health status. Osteopathic physicians have referred to this phenomenon as restoring the body's capacity to heal itself. Meeting patients' expectations includes documenting changes in health status. Health as de-

continued on page 37

Letters to the Editor

Dear Editor:

I read with concern Dr. Jealous' article, "Accepting the death of osteopathy." I fear that many other Academy members believe, as Dr. Jealous does, that osteopathy is, in fact, dead and must experience a rebirth in order to live again. Such beliefs in the demise of osteopathy have served to fuel the rise and subsequent support by American DOs of non-physician osteopathic programs internationally. This "new" osteopathy is everything Dr. Jealous infers as the rebirth of osteopathy, and is spreading like wildfire. Professional licensure for non-physician DOs in Europe and abroad is already a fact. This might seem a positive development to true believers of osteopathy but, in fact, I believe it is the greatest threat to osteopathy since the California amalgamation.

I believe that osteopathy is, in fact, still alive and well; rather, it is the osteopath who is dying. What is the difference between the death of osteopathy and dying osteopaths? The difference is more in the rebirth than in the death itself. The death of osteopathy requires a new profession to be reborn; dying osteopaths only require a new generation of osteopaths. Consider who and what we're talking about-a new profession versus a new generation.

Currently, comprehensive education and licensure of non-physician osteopaths is an international phenomenon. But, what happens when the phenomenon reaches America? Imagine, if you will, an American osteopathic profession of non-physicians. How will Congress react when it hears that non-physician osteopaths far outnumber physician osteopaths, not to mention that medical osteopathy is "dead"? For a new generation of osteopathic physicians to surface, alliances must be made with other physicians eager to embrace osteopathy, establishing *medical* standards for osteopathic practice, education, and certification. This represents a new resurgence of osteopathy that, personally and professionally speaking, I feel reflects more accurately the vision of osteopathy and its founder, A.T. Still.

The new osteopath, physician or non-physician, who shall decide?

Harry D. Friedman, DO
Corte Madera, CA

Dear Editor:

We very much appreciated the excellent article by Jackson and Steele,[1] "Osteopathic treatment of asthma: A literature review and call for research" and would like to pass along some additional information on this important topic.

With regard to asthma pathogenesis, the autonomic imbalance model in its various forms has been widely explored. However, the *vasomotor* component of asthma, with respect to autonomic imbalance, represents a significant although relatively obscure aspect that holds great potential as a research model linking somatic dysfunction to the pathophysiology of asthma. Charles Hazzard, an influential early osteopath, summarized the effects of lesions *and* asthma as abnormal motor effects, and abnormal vasomotor effects:

"... lesions cause abnormal motor effects both in arousing spasmodic conditions of the muscles of the bronchial walls, and in the vasomotor activity that produces the hyperemia of the mucous membrane."[2]

The traditional osteopathic perspective coincides with modern views on nervous system involvement in asthma. Dysautonomia has been described in asthma with an emphasis on hyper-responsiveness of the parasympathetic system[3,4] beta-adrenergic hypo-responsiveness5 or both.[6,7] In contrast to the relatively dense parasyrnpathetic nerve supply to airways, sympathetic (adrenergic) innervation is sparse in humans.[8] However, sympathetic innervation of the bronchial blood vessels is considerable. Thus, beta-adrenergic hypo-responsiveness may reflect an inhibition of the sympathetic system which results in vasodilation of the bronchial blood vessels. Hyperemia of bronchiai vessels in asthmatics has been noted[9,10,11,12] and attributed to sympathetic vasodilation.13 Exercise-induced asthma is thought to be produced by increased bronchial circulation.[14,15]

With regard to the widely publicized asthma study by Balon et al,[16] "active" and "simulated" chiropractic manipulation were used as adjunctive treatment for childhood asthma. The active treatment consisted of "manual contact with spinal or pelvic joints followed by low-amplitude, high velocity directional push often associated with joint opening, creating a cavitation, or "pop". This treatment is a standard direct technique used by a wide variety of manual therapy practitioners, primarily chiropractors and osteopaths. The simulated treatment involved soft-tissue massage and gentle palpation to the spine, paraspinal muscles, and shoulders. Jongeward questioned the appropriateness of the simulated treatment, noting that standard chiropractic practice commonly includes soft tissue work.[17] Furthermore, the sham treatment in the Balon et al study bears a marked similarity to a traditional osteopathic treatment for asthma[2,18,19,20] all documented on the internet.[21]

The authors of the study summarized the simulated treatment by stat-

ing, ''Hence, the comparison of treatments was between active spinal manipulation as routinely performed by chiropractors and hands-on procedures without adjustments or manipulation." Apparently, these investigators were unaware of the early osteopathic works addressing asthma and the more recent literature on OMT for respiratory problems in general, particularly as cited in *Osteopathic Considerations in Systemic Dysfunction.*[22]

The results as reported by the researchers were, "Symptoms of asthma and use of Bagonists decreased and the quality of life increased in both groups, with no significant differences between the groups." Based on this equality of improvement, the authors concluded, "the addition of chiropractic spinal manipulation to usual medical care provided no benefit".[16] In our view, this is unfortunate, because the data indicates that the subjects in both groups improved after being treated by standard chiropractic and a rather crude form of traditional osteopathy.

Our letter published in the *New England Journal of Medicine*[23] pointed out the methodological flaws of such designs where sham treatments closely resemble specific traditional osteopathic techniques. Our article in the *Journal of Manipulative and Physiological Therapeutics*[24] addresses the question of physiological effects of manual therapy and appropriate sham treatments in more detail and, like the Jackson and Steele article, emphasizes the need for more research.

References

1. Jackson KM and Steele KM: Osteopathic treatment of asthma: A literature review and call for research. AAO Journal, 1999; 9(4):23-27
2. Hazzard C: The Practice and Applied Therapeutics of Osteopathy. 3rd ed. Kirksville, MO; Journal Printing Company, 1905:75-80.
3. Kallenbach JM, Webster T, Dowdeswell R, Reinach SG, Millar RN, Zwi S: Reflex heart rate control in asthma. Chest, 1985; 87:644-648.
4. Shah PKD, Lakhotia M, Mehta S, Jain SK, Gupta GL: Clinical dysautonomia in patients with bronchial asthma. Chest, 1990; 98:1408-1413.
5. Casale TB: The role of the autonomic nervous system in allergic diseases. Annals of Allergy, 1983; 51:423-429.
6. Kaliner M, Shelhamer JH, Davis PB, Smith LJ, Venter JC: Autonomic nervous system abnormalities and allergy. Annals of Internal Medicine, 1982; 96:349-357.
7. Jindal SK, Kaur SK: Relative bronchodilatory responsiveness attributable to sympathetic and parasympathetic activity in bronchial asthma. Respiration, 1989; 56:16-21.
8. Nadel JA, Barnes PJ: Autonomic regulation of the airways. Ann Rev Med, 1984; 35:451-467.
9. Baier H, Long WM, Wanner A: Bronchial circulation in asthma. Respiration, 1985; 48:199-205.
10. Lockhart A, Dinh-Xuan AT, Regnard J, Cabanes L, Matran R: Effect of airway blood flow on airflow. Am Rev Respir Dis, 1992; 146:Sl9-S23.
11. Li X, Wilson JW: Increased vascularity of the bronchial muscosa in mild asthma. Am J Respir Crit Care Med, 1997; 156:229-233.
12. Kumar SD, Emery MJ, Atkins ND, Danta I, Wanner A: Airway mucosal blood flow in bronchial asthma. Am J Respir Crit Care Med, 1998; 158:153-156.
13. Widdecombe JG: Neural control of airway vasculature and edema. Am Rev Respir Dis, l99l; 143:S18-S21.
14. McFadden ER: Hypothesis: Exercise-induced asthma as a vascular phenomenon. The Lancet, 1990; 335:880-883.
15. Anderson SD, Daviskas E: The airway microvasculature and exercise induced asthma. Thorax, 1992, 47:748-752.
16. Balon J, Aker PD, Crowther ER, Danielson C, Cox PG, O'Shaughnessy D, Walker C, Goldsmith CH, Duku E, Sears MR: A comparison of active and simulated chiropractic manipulation as adjunctive treatment for childhood asthma. N Engl J Med, 1998; 339:1013-20.
17. Jongeward BV: Chiropractic manipulation for childhood asthma. N Engl J Med, 1999; 340:391-392.
18. Barber ED: Osteopathy Complete. 4th Ed. Kansas City, MO: Hudson-Kimberly Publishing Company, 1898:60-68.
19. Goetz, EW: A Manual of Osteopathy. 2nd ed. Cincinnati, OH: Natures's Cure Co., 1909:85-86.
20. Murray CH: Practice of Osteopathy (6th Edition). Elgin, Illinois: CH Murray, 1925.
21. McMillin D: The Early American Manual Therapy website is located at: http://members.visi.net/mcmillin/l998.
22. Kuchera M, Kuchera WA: Osteopathic Considerations in Systemic Dysfunction. Kirksville, MO: KCOM Press, 1991.
23. Richards DG, Mein EA, Nelson CD: Chiropractic manipulation for childhood asthma. N Engl J Med, 1999; 340(5):391-392.
24. Nelson C, Redwood D, McMillin D, Richards DG, Mein EA: Manual healing diversity and other challenges to chiropractic integration. J Manipulative Physiol Ther (2000, in press).

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Dear Editor:

James Jealous, DO should be highly commended for an excellent presentation of his Thomas L. Northup Lecture, "Accepting the Death of Osteopathy: A New beginning". While it is difficult for me to accept the fact that osteopathy is dying, Dr Jealous told it like it is. The art of treating the whole person From an osteopathic viewpoint has been lost. Our question is, can we get it back?

As an older DO, I can recall many osteopathic physicians prior to World War II who had acute care practices, who never lost a patient treating all types of pneumonia, influenza, strep throat, rheumatic fever, glomerulonephritis, peptic ulcer disease, otitis media, mastoid infections, severe sinus infections and many other such problems. These physicians were practicing with just manipulative therapy. However when the antibiotics were introduced, ten fingered osteopathy was omitted, because the DOs at that time wanted to be modern and up to date, employing the latest in pharmaceuticals. They abandoned their birthright and decided that helping the body to heal itself was an unnecessary waste of time, as they

now could treat specific diseases and forget about the patient who had the disease. Those DOs had become real doctors overnight, but unfortunately they lost their confidence, knowledge and interest in treating these acute care problems with manipulation.

When these DOs accepted this mind set, osteopathic medicine, as it was practiced before the mid-1940s began to die and it has been dying ever since. The DOs of the pre-1940's possessed the confidence, the insight and the real ability to get their patient over their illness and restore them to health quickly. Furthermore, these physicians were not losing their patients to fatal drug reactions, which in the last year caused 180,000 deaths in these United States and was in fourth place as the leading cause of death behind heart attacks, cancer and strokes. Perhaps, we ought to have a fund drive to control this disturbing problem.

I am not opposed to pharmaceuticals, but some real consideration must be given to the patient before we reach for the prescription pad or the syringe. But if I can restore health to my patient without resorting to any other modality, I will utilize osteopathic manipulation, the most powerful, single modality in the healing arts. Fortunately, from the time that I graduated from PCOM, I developed sufficient manipulative skills to assist my patients in their recovery and at times was amazed with the results that I did not necessarily expect. But unfortunately, the more recent DO graduates will not try manipulation, nor take the time to learn, because they do not understand that it works.

Many years ago, my father-in-law, a well-respected busy MD general practitioner in Hancock, N.Y. said to me in 1950, " It is a crying shame that we MDs do not wake up and practice like you DOs". He could see the advantages of having that extra modality of manipulative therapy to use in practice. He witnessed first hand what the bonafide osteopathic physician was able to accomplish with their patients that the MDs could not. He saw the concept of osteopathic medicine that escapes so many young osteopathic student minds today. It is a shame, but they will be shortchanging their patients, though of course, it is not all their fault.

Another reason why osteopathy is dying is that the art of medical practice has been lost to the technicians and technology advancements of the last 30 years. A physician no longer has to lay on hands, palpate, feel, touch, listen, think anatomically. The MRIs, CT scans, ultrasound machines will make the diagnosis, find the disease, but will never find health. As Dr. Still said, " Any fool can find disease, it takes a real physician to find health. How true.

As for me, I would not trade my DO education, or my degree for 10 MD degrees to serve as a general practitioner. If I were to have received a MD degree, I would have felt inadequately trained. Too much attention has been given in our osteopathic colleges to turn out, "Just as good as physicians". As a profession, perhaps we should think more about our heritage, condense our colleges into real osteopathic institutions and give real incentives to those who wish to study and teach manipulation. In so doing, we might just have a good chance to revive a dying profession. But the way we are headed, we are doomed and the legacy of A.T. Still will be a short page in the history book.

Manipulation takes time, but it is so rewarding to the patient and to the physician. I have never known any DO who was reasonably skilled in the art of manipulation, who could not make a respectful living, and their patients were most willing to pay them for that added benefit. With the trend in health care today, I think the young DO student better take another look at the value and the benefits of manipulation.

Robert T. Kellam DO
Orlando, Florida

Dr H.H. Underwood, the first DO to practice in the State of New York, practiced in Hancock, N.Y.

Dear Editor:

The article in the Winter 1999 AAO Journal by Charles Crosby attracted my attention.

As recently as the 28th of November, at the Osteopathic Research Conference in London, sponsored by the British College of Naturopathy and Osteopathy, a paper was presented looking at the increase of pulmonary FEV1 in asthmatics following simple rib raising. One might find it interesting that Australian researcher measured a 16% increase in FEV1 after rib raising (much the same as Dr. Crosby finding). Dale Pratt Harrington, DO, at OU-COM, did a pilot study of a similar nature on post-op patients.

Both studies indicated an increase in pulmonary ventilation.

The question is now raised whether management of the leg length inequality played any role in changing the pulmonary function in this admittedly small sample given we have some proof in hand that manipulation alone seems to do just that.

All of which seems to support the old adage that any research project asks more questions than it answers.

My research mentors, when helping me plan outcome studies of the effect of manipulation, where controls and "sham treatment" defy description and application, suggested we document first that the usual and full osteopathic management of a patient does cause a measurable change. Once this is established one can tease out each component of the management plan and test it separately for therapeutic efficacy.

Before he goes beyond the pilot study, Dr. Crosby might want to redesign his project in a way that increases its statistical power, perhaps by a crossover design as well as by increasing the m~, and certainly by satisfying himself he wants to test the outcome of two therapeutic modalities applied at the same time.

→

I am also interested to know if Dr. Crosby applied the heel lifts in response to leg length difference alone or whether he was responding to the sacral base unleveling identified in the standing films. I'm not certain any research evidence exists supporting one of the other of these methods, although many of us have been taught teach(~hat heel lift management should respond to the sacral base lateral declination.

Another interesting pilot study. I hope Dr. Crosby will follow it up.

David A. Patriquin, DO

Dear Editor:

Recent AAO and AOA publications and PR efforts have promoted osteopathic unity and distinctiveness. These are ideals, which all DO's can easily support.

However, the students of the profession and *The AAO Journal* subliminally undermine these valiant efforts. How? Just look at *The AAO Journal's* student corner! Student X MSIII - MS = Medical Student.

Our colleges are colleges of osteopathic medicine not colleges of medicine - hence we do NOT have medical students - we have osteopathic medical students or OMSI-II. At TUCOM, I have repeatedly made this point and some of our faculty and administrators agree with me and we are evolving to the term OMS instead of MS.

If we promote ourselves and our profession as distinctive we are compelled that we should label our students distinctively as well. To that end, *The AAO Journal* should never use the MS abbreviation for a student but the OMS abbreviation. (Unless the Osteopathic student holds an MS or Masters of Science degree!)

Robert C. Clark, DO,
Chairman, OMM Dept
TUCOM

From the Archives

The Future of the Osteopathic Profession cannot be Predicted with Certainty

The future of the osteopathic profession cannot be predicted with certainty. The fundamental principles which underlie osteopathic practice are of course permanent and will endure under whatever name they are practiced. The osteopathic profession must maintain its independence until the principles which it represents receive universal recognition by the therapeutical world. The fear is sometimes expressed that osteopathy will be absorbed by medicine. This cannot be so, since osteopathy is a part of medicine and consists of a set of principles which are true. As long as the profession of osteopathy maintains its own institutions and abides by its principles it will maintain its identity. When the principles of osteopathy are identical with the principles of medical practice, the profession of osteopathy will have fulfilled its mission. The questions as to whether the healing art will adopt the name osteopathy is a minor matter. The history of the osteopathic profession at any such time will speak for itself and the contribution of Andrew Taylor Still will be recognized for its true worth.

Present indications do not point to such a happy summation in the near future. Half a century is an insufficient time to overthrow the accumulations of centuries of tradition and custom. The task of the osteopathic profession to establish the principles of Dr. Still as the foundation of practice is but begun. In the meanwhile growing public opinion, more adequate educational advantages, well financed institutions, and scientific investigation will continue to stimulate the growth of the greatest contribution to the healing art in recent times.

[**Editor's Note:** Should the use of the term Osteopathy continue to be used interchangeably with Osteopathic Medicine? Through the effort of the leadership of the American Academy of Osteopathy in 1994, the Board of Trustees of the American Osteopathic Association adopted such a policy. All AOA policies are reviewed at five-year intervals. A July 1999 Resolution recommends the reaffirmation and further amendment of a 1960 editorial policy which limits the use of the term Osteopathy to historical, sentimental and informal discussions. The amendment, as proposed in Resolution 231, would relegate the definition of Osteopathy to international health care practice by providers who do not hold unlimited license for practice. Resolution 231 is under review by AOA legal counsel, with a report to the AOA House of Delegates expected in July 2000.

Within the first decade of the death of Andrew Taylor Still, Leon E. Page, DO, addressed the future of the osteopath profession in terms which have bearing on the current policy review. The following quotation is taken from Doctor Page's text, *Osteopathic Fundamentals*, Journal Printing Company; Kirksville, MO; pp. 181-182. As you read these comments, consider expressing your opinion about the use of the term Osteopathy.]❐

Student's Corner

Case Study of a 42-year-old patient with Systemic Lupus Erythematosus

by Neil Zucker, MS-III, University of North Texas Health Science Center in Fort Worth

Introduction

Osteopathy is built on the foundation that the body functions as a unit, has self regulatory mechanisms, and structure and function are reciprocally related. Although the days of blood letting are over, there are still treatments today that bypass this self-regulatory and body unitary function. Medications that provide relief but do not allow the body to recover are only a temporary solution. In the late 1800s, patients with gout were treated with opiates that allowed for temporary relief, but no benefit was gained against the deposition of uric acid crystals. The opiates actually caused worse side effects, such as heart and respiratory complications, than the disease it was being used to treat. In the 1990s there are diseases for which pharmacology has no solution. Drugs can stop bacteria, fungus and some virus from attacking cells, but this therapy has yet to resolve the syndrome of human cells turning on each other. Although some medications, most notably - Glucocorticoids, allows a period of alleviation by knocking out the immune system, its side effects can be more debilitating than the disease itself. What is the solution? This is the point where as an osteopathic physician we must go back to the roots, to the foundation that built osteopathy. The body functions as a unit, has self-regulatory mechanisms, and structure and function are reciprocally related.

Case report

Chief Complaint

The patient is a 42-year-old white female with a chief complaint of left shoulder pain, low back pain, left hip pain and continued manipulative treatment for systemic lupus erythematosus (SLE).

History of Chief complaint and Past Medical History

In approximately 1980 the patient was diagnosed with SLE. At that time she was started on glucocorticoid therapy (dexamethasone) for SLE flare-ups such as headaches, fever, and joint pain. The SLE and glucocorticoid therapy resulted in numerous complications for the next 10 years. One complication that incurred was necrosis to the bone. The necrosis to both her left hip and shoulder resulted in replacement surgery for both. The patient also showed signs of necrosis in low back, which radiographically showed up as a compression fracture of the L1 vertebrae. Her heart was also affected. She developed coronary artery disease and infarcted heart muscle on six different occasions. During these 10 years, she showed little improvement in flare-ups and thus glucocorticoid use continued. In 1990 the patient began manipulative therapy. Therapy consisted of 99% cranial and 1% spinal treatment. Since this time there has been no SLE flare-up and thus glucocorticoid treatment was discontinued. She has had no fever or headaches associated to her condition and minimal joint pain as compared to the 10 years previously. At the present time she states that she has lots of left shoulder pain and classifies it as "terrible." Her low back pain she states is attributed to activity during the holiday.

Review of Systems

The patient denies any gastrointestinal, genitourinary, respiratory, neurologic, cardiovascular or endocrine disturbances.

Past Surgical History

The only surgical history that could be ascertained was both a left hip and shoulder replacement surgery.

Physical Examination

Cervical spine: no somatic dysfunction; Thoracic spine: T8 rotated right and side bent left; Lumbar spine: L5 rotated left and side bent left; Sacrum: markedly inferior left; Inferior lateral angle (left sacral shear)

Assessment

1. Somatic dysfunction of thoracic spine
2. Somatic dysfunction of lumbar spine
3. Somatic dysfunction of sacrum
4. Somatic dysfunction of pelvis
5. Pain resulting from left hip and shoulder prosthesis
6. Arthralgia resulting from SLE concomitant with prior corticosteroid use.

Treatment Plan

(1) Continue cranial treatment with the goal of continued remission of SLE. The cranial treatment consists of using the inherent mechanism of movement of cranial bones and taking it where it wants to go.
(2) Soft tissue on thoracic and lumbar spine
(3) Indirect and muscle energy on the thoracic and lumbar spine
(4) Muscle energy and springing on the sacral shear
(5) Compression/ decompression of the pelvis
(6) Return to clinic in 2 weeks.

Discussion/ Review of Literature

In this section, 2 main areas will be addressed. The first area to be addressed will be the pathogenesis and clinical features of SLE. The other area explored will be the affects of glucocorticoids and cranial manipulation.

SLE is an autoimmune disease of unknown etiology. 90% of the patients are women within childbearing years. The defect, in this disease, is an unregulated hyperactivity of the T and B cells in the immune system. These unregulated cells cause destruction of tissues in two ways. First, the autoantibody binds to a host cell and causes direct lysis. This type of reaction occurs most often with red blood cells and platelets. The autoantibody can also bind to the host cell and activate the complement system, which allows for destruction of both the attached cell and the surrounding tissue. There is much dilemma on whether the autoantibody becomes sensitized to normal host cell antigens or whether the host cells contain foreign antigens that are attached by normal immune counterparts.

The clinical course is marked by spontaneous remissions with 20% of patients exhibiting true remission. One clinical feature of SLE is that it may affect one or multiple organs. Joint symptoms are most often the earliest sign of the disease. Arthritic pain is intermittent and often does not correlate with physical findings. Cutaneous involvement most often comes in the form of a malar rash, photosensitivity or alopecia. SLE also has effects on the heart causing myocarditis and pericarditis, which can precipitate arrhythmias. Hemato-logically, it may cause a decrease in white blood cells, red blood cells, and platelets. In the kidney, it can cause destruction of tissue resulting in a nephrotic syndrome or kidney failure. Finally in the CNS, effects can range from headaches to a decrease in cognitive functioning.

When a patient is diagnosed with SLE, treatment is correlated with the symptoms or flare-ups currently present. Patients with mild disease and no life threatening manifestations should be managed with NSAIDS or hydroxychloroquine (for cutaneous manifestations). As symptoms and flare-ups worsen or life-threatening manifestations develop, patients are put on glucocorticoids. This treatment is reserved until this time because of the vast and possible life threatening side effects.

Glucocorticoids main function in the treatment of SLE is to knock out the immune system. It suppresses normal functioning of white blood cells and the inflammatory components, which means if T and B cells are not present then they cannot attack normal host cells in a person with an autoimmune dysfunction, such as SLE. The problem is that it might suppress some symptoms but at the same time allow for a multitude of other disease processes to take effect.

Some of the side effects of chronic glucocorticoid therapy in SLE patients are weight gain, hypertension, infection, diabetes mellitus, coronary artery disease, and ischemic necrosis of the bone. Cause of death within five years of diagnosis of SLE is most commonly infection. The dilemma is if the cause of death is from the disease process itself, glucocorticoid therapy, or a combination of both. Recent literature suggests that glucocorticoid therapy is a major factor. "Infections are more likely to develop in patients with active SLE receiving high dose corticosteroids or immunosuppressive therapy as opposed to minimal or no corticosteroid therapy."[1]

The most common cause of death for patients with SLE for longer than five years is arteriosclerosis. Cortisol treatment hastens this process. " A comparison of patients without arteriosclerosis to patients with angina and/or myocardial infarction revealed that the average dose of corticosteroids was significantly higher among patients with arteriosclerosis."[1] The main objective of cranial manipulation, on the other hand, is to return body structure and function back to homeostasis. If the body is going to fight disease, it will have more of a chance if it is functioning optimally. "Cranial manipulation allows for optimal functioning of the primary respiratory mechanism which not only affects the CNS but also every cell and tissue in the body."[2] It is this primary respiratory mechanism "that the physiologic centers that control and regulate pulmonary, respiratory, circulation, digestion and elimination.... depend on for normal functioning of the CNS"[2] The pituitary, for example, depends on the primary respiratory mechanism for uncompromised blood flow and normal tension in the dura that surrounds its stalk.

[1]Abu-Shakra M et al: Mortality studies in systemic lupus erythematosus: Results from a single center. I. Causes of death. J Rheumatol l995;22:1259
[2]Lay, Edna M. *Foundations for Osteopathic Medicine*. Philadelphia, PA. Williams and Wilkins; 1997 pgs 901-913

Conclusion

Why cranial manipulation worked in this case study and corticosteroids did not. Corticosteroids are only a temporary solution whereas cranial manipulation can be a permanent one. Corticosteroids may alleviate some of the symptoms but may cause newer more severe complications. The 42-year-old patient of topic exhibited many of the side effects of glucocorticoid therapy. She already had 6 myocardial infarctions due to coronary artery disease, the replacement of both the left hip and left shoulder due to ischemic necrosis, and a lumbar compression fracture at L5. Continued therapy of Cortisol treatment for flare-ups would have been more debilitating and probably fatal. Cranial manipulation, on the other hand, succeeded through a combination of processes. As mentioned earlier, cranial manipulation allows for optimal functioning of the primary respiratory mechanism, resetting of the pituitary gland for normal functioning, and homeostasis of the physiologic centers of the body. In this case, 1 or the combination of all 3 allowed for the lymph system to normalize and allow the body to use its own innate ability to overcome the disease process.

References

Hahn, Bevra H. Principles of Internal Medicine. 14 ed. San Francisco, CA. McGraw-Hill;1998. pgs 1874-1880.

Lay, Edna M. Foundations for Osteopathic Medicine. Philadelphia, PA. Williams and Wilkins; 1997 pgs 901-913

Cush, John J. Rheumatology. Philadelphia, PA. Williams and Wilkins; 1999. Pgs 363-371.

DiGiovanna, Eileen L. An Osteopathic Approach to Diagnosis and Treatment. Philadelphia, PA. Lipincott Raven; 1997

Abu-Shakra M et al: Mortality studies in systemic lupus erythematosus:

Results fom a single center.I. Causes of death. J Rheumatol 1995;22:1259❐

[Editor's Note: *S/D Neil Zucker is currently a senior at University of North Texas Health Science Center in Fort Worth/Texas College of Osteopathic Medicine*]

AAO's CME Calendar

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March

23-26
2000 Annual Convocation
American Academy of Osteopathy
Renaissance Cleveland Hotel
Cleveland, OH
Hours: 30+ Category 1A

April

14-16
Ligamentous Articular Strain
Holiday Inn Select Airport
Indianapolis, IN
Hours: 20 Category 1A

28-30
Muscle Energy Tutorial
Holiday Inn Airport Select
Indianapolis, IN
Hours: 20 Category 1A

May

12-14
Stimulated Ligament Reconstruction/ Above the Diaphragm (Prolotherapy)
UNECOM, Biddeford, ME
Hours: 20 Category 1A

June

2-4
The Still Technique: A Manipulative Method of Andrew Taylor Still, MD
Holiday Inn Airport Select
Indianapolis, IN
Hours: 20 Category 1A

14-16
Diagnosis and Treatment of Low Back Pain
Big Sky Resort, Big Sky, MT
Hours: 20 Category 1A

July

14-16
Alleviation of Common, Chronic Pain by Optimization of Posture
OSUCOM
Tulsa, OK
Hours: 20 Category 1A

August

17-20
OMT Update
Contemporary Hotel
Buena Vista, FL
Hours: 23 Category 1A

25-27
Visceral Manipulation/Abdominal/GI
Holiday Inn Airport
Indianapolis, IN
Hours: 24 Category 1A

September

13-15
Therapeutic Exercise with OMT
Holiday Inn Airport
Indianapolis, IN
Hours: 20 Category 1A

16-17
Advanced Percussion Vibrator
Holiday Inn Airport
Indianapolis, IN
Hours: 14 Category 1A

October

13-15
Stimulated Ligament Reconstruction/ Below the Diaphragm (Prolotherapy)
UNECOM
Biddeford, ME
Hours: 20 Category 1A

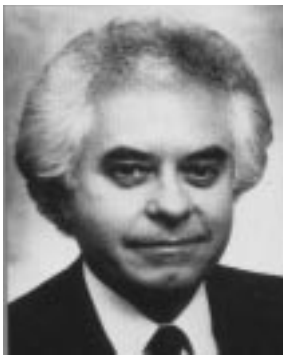
October 29-November 2
AOA/AAO Convention
Orlando, FL

December

1-3
Visceral Manipulation/Thorax/Dura
Holiday Inn Airport
Indianapolis, IN
Hours: 24 Category 1A

In Memoriam

Bob E. Jones, CAE



Oklahoma Osteopathic Association Executive Director Emeritus, **Bob E. Jones**, CAE, passed away on February 3. He had served as CEO of the OOA since 1969 and contributed nationally to the osteopathic medical profession in leadership capacities with both the American Osteopathic Association and the Association of Osteopathic State Executive Directors. He was the author of the 1978 book entitled *The Difference a D.O. Makes: Osteopathic Medicine in the Twentieth Century* and the 1991 revision entitled *Osteopathic Medicine: The Premier Profession*. Both publications have been widely used to educate the public about the profession. The AOA presented Mr. Jones with its Distinguished Service Certificate at the 1999 Convention in San Francisco. Since he was unable to attend due to an initial stroke on February 4, 1999, his spouse, Gayle Jones, and daughter, Julie Atyia, accepted the award for him.

Associate Executive Director **Diana Finley**, a friend of Mr. Jones for over 30 years, represented the Academy at his funeral on February 8 in Oklahoma City. The AAO leadership was in attendance at the AOA Board of Trustees meeting at the time of the service.

He is survived by his wife Gayle Jones of the Oklahoma City; daughter Jennifer and son-in-law Brian Cain of Edmond, OK and daughter Julie and son-in-law Matthew, also of Edmond; three grandchildren, Allyson and Carter Cain and Justin Atyia; as well as two sisters and many nieces and nephews.

The family suggests contributions to the Oklahoma Educational Foundation for Osteopathic Medicine, Bob E. Jones Endowed Student Scholarship Fund, c/o OEFOM, 4848 N. Lincoln Blvd., Oklahoma City, OK 73142.

His friends in the osteopathic profession will miss him. AAO sends condolences to his family.❐

Brain Wave Pattern Changes in Children with ADD/ADHD following Osteopathic Manipulation: A Pilot Study

by Stephen D. Blood, DO, FAAO, FACGP and Barry A. Hurwitz, PhD, BCIAC

Biofeedback instruments measure, monitor, amplify, and instantaneously feedback to the subject subtle information about internal, often unconscious physiologic processes (i.e. temperature of the distal joint of the middle finger of the left hand, or dominant brain wave activity). This information is used by the client to alter behavior patterns (i.e. increase blood flow to the area and, thus, generate a feeling of relaxation, or decrease a particular band of brain wave activity, enhancing the ability to concentrate).

EEG Biofeedback uses sensors attached to the scalp to record brain wave activity. This information is sent to a computer that employs auditory and/or visual displays to inform the client about the activity of his/her brain. The information can be used by the client to alter the pattern of brain wave activity in the desired direction.

Children diagnosed with Attention-Deficit/Attention-Deficit Hyperactivity Disorder (ADD/ADHD) experience difficulties with concentration, staying on track, sustaining motivation, regulating energy, organizing information, working on their own and interacting socially with others. ADHD children are impulsive, excessively motoric, rigid and often oppositional. They have difficulties learning from experience and planning for the future. These behavioral characteristics are associated with impairments of the frontal lobe and related brain structures, especially the prefrontal areas, the basal ganglia and the limbic arousal system.

Electroencephalogram (EEG) research (Jaspers et al, 1938; Mann et al, 1991) has found excessive slow wave activity in central and frontal portions of the brains of individuals diagnosed with ADD/ADHD. Other neurological investigations have found metabolic and blood flow abnormalities in the same regions.

The main premise for using EEG Biofeedback Training in the treatment of ADD/ADHD is that if the underlying neurological deficit can be remedied, the child will be more capable of self-regulating the behaviors dependent on intact prefrontal lobe functioning. For children with ADD/ADHD, the goal is to reduce Theta, slow wave activity associated with daydreaming which interferes with concentration, information processing and other organized cognitive activities.

Over a period of more than 20 years, Lubar and his colleagues have demonstrated that the application of the principles of EEG Biofeedback Training have improved the ability to self-regulate the brain wave activity and enhanced cognitive efficiency and behavioral control (Lubar, 1995; Mann et al., 1991; Lubar & Shouse, 1976).

Cranial manipulation is a treatment that has been rooted in the osteopathic profession for the past 65 years. It is an approach and technique developed by William Sutherland, DO during the 1930s. The treatment is a hands-on application to the head, using gentle palpation to diagnose and treat asymmetries of the skull, using the energy of the brain and the brain's motion cycle to correct mechanical imbalances found in the skull and its structures.

The treatment is controversial in the medical establishment because anatomists still insist that the skull is solid bone. But, histological evaluations of the skull sutures have shown that there is elastic tissue present between bones of the skull. Polygraphs using pressure sensitive gauges applied to the temporal bones have shown that there is a cyclic phenomena in the motion of the head—a rhythm of eight to twelve cycles of expansion/contraction per minute.

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During cranial evaluation and treatment, it has been the observation of osteopathic physicians that certain cranial abnormalities are present in children after difficult labor and delivery and in children with "minimal brain damage" (ADD/ADHD). The manipulation promotes symmetry, changes in cranial rhythm and normalization of behavior, including impaired concentration and learning and impulsivity.

In the current investigation, six children were evaluated by a single channel CapScan EEG Biofeedback device before and after cranial manipulation. Four of the children were independently diagnosed as suffering ADHD. Two children had not been so diagnosed but were identified by their parents as exhibiting some of the characteristics of this disorder based on responses to the Conners Behavior Checklist.

Brain wave activity is described in terms of Hertz or cycles per second (cps). Slow brain wave generally refers to brain wave activity below eight cps. Delta activity (0.5—4 cps) is associated with sleep and theta activity (4-8 cps) is associated with states of revelry. Relatively high theta activity interferes with concentration. Alpha rhythm encompasses wave bands between 8 and 12 cps and is identified with feelings of relaxation. Beta waves include activity faster than 12 cps. "Sensory-Motor Rhythm" (SMR) refers to wave activity between 13 and 15 Hertz activity, while rhythms above 15 Hertz are referred to as "fast beta". An increase in SMR is often accompanied by a reduction in over-activity. Fast beta is associated with efficient information processing.

This investigation focused on the effects of cranial manipulation on amplitude level of slow wave activity (2-6 cps). Each child was hooked to the CapScan EEG Biofeedback device and amplitudes of slow wave activity were recorded for a period of 100 seconds. The child was seated in a typical office chair facing away from the computer screen and with the audio signal muted in order to avoid the feedback condition and the possibility of improved performance due to learning. The hook-up and recordings were done by a Licensed Psychologist who is also a Certified EEG Biofeedback Therapist.

Osteopathic manipulation followed immediately with the child in a supine position on a standard, portable treatment table. Treatment was administered between 5 - 1 5 minutes depending on the osteopathic physician's assessment of the child's needs. High velocity direct action techniques were used in the spinal areas and direct action decompression techniques were used on the cranium. EEG Biofeedback readings over a 100 second time frame were repeated straightaway. In addition, a graph of the dominant brain wave activity over 40 epochs of one second was plotted following each of the two 100 second trials.

The average slow wave brain wave activity prior to treatment was 27.9 microvolts (μv), significantly above the expected range for "normal" children in this age group. Following treatment, the average amplitude was 23.1 μv. This level is still significantly above "normal" but statistical analysis of the difference between the means (4.8 μv) is significant at the <.20 level. This means that the likelihood of the occurrence of a reduction in slow wave activity of this magnitude occurring by chance is less than 20 in 100.

For one child, slow wave amplitude was recorded before and after a placebo condition (the osteopathic physician placed his hands on the child's head but no manipulation was done) and then during the active cranial manipulation. A decrease in slow wave activity of only 1.6 μv occurred after the placebo condition but an additional decrease of 3.1 μv was observed over the course of 6 minutes of cranial manipulation (Total decrease from pre-treatment level = 4.7 μv).

Despite the positive implications of the outcome of this investigation, replication with a larger sample of children and under more rigorously controlled conditions is essential before any meaningful conclusions can be drawn. Nevertheless, the probability of an association between osteopathic manipulation and reduction in slow brain wave activity is suggested.

In this investigation, only the relationship between osteopathic manipulation and slow brain wave amplitude was studied. The focus was not on the combined effects of the treatments. In order to accomplish this, behavioral measures are required to assess the effectiveness of combined treatment in reducing symptoms of cognitive and behavioral dyscontrol in children diagnosed with ADD/ADHD. These results would then be compared with the independent success rates of EEG Biofeedback Training and osteopathic manipulation in treating ADD/ADHD.

Bibliography

Jaspers, H.H., Solomon, P., Bradelry, C. (1938). Electroencephalographic analysis of behavior problems in children. American Journal of Psychiatry, 95, 641-658.

Lubar, J. (1995). Neurofeedback for the management of attention-deficit/hyperactivity disorders. In Mark S. Schwartz and Associates, Biofeedback: A Practitioner's Guide. 2nd Edition (493-522). New York: Guilford Press.

Lubar, J. & Shouse, M. (1976). EEG and behavioral changes in a hyperkinetic child concurrent with training of sensorimotor rhythm (SMR): A preliminary report. Biofeedback and Self-Regulation, 3, 293-306.

Mann, C., Lubar, J., Zimmerman, A., Miller, C. & Muenchen, R. (1991). Quantitative analysis of EEG in boys with attention-deficit-hyperactivity disorder: Controlled study with clinical implications. Pediatric Neurology, 8, 30-36.❐

Research Directions From 1940-1988

by Myron C. Beal, DO, FAAO, Professor Emeritus Michigan State University

Prior to the 1940s osteopathic hypotheses concerning somatic dysfunction (the osteopathic lesion) were based upon histological work from animal experiments performed by Deason and Burns, anecdotal clinical experience, and experimental reports from the medical literature. Results from the use of palpatory testing were viewed as subjective and questionable.

The publication of Denslow's paper in 1941[1], on the reflex activity of the spinal extensors, had a profound effect. His research demonstrated by electromyographic testing that there was a decrease in the thresholds for reflex muscle activity at areas of somatic dysfunction in human subjects. These results had direct application to osteopathic theory concerning the osteopathic lesion. Denslow's work gave rise to the concept of facilitation which has helped explain the local and remote effects associated with somatic dysfunction. Denslow had been appointed to the faculty at Kirksville College of Osteopathic Medicine in 1938. With his appointment, the College formed and funded a research laboratory.

Other faculty were recruited to participate in the research programs at Kirksville: H.G. Clough, DO, Charles C. Hassett, PhD, Albert P. Kline, PhD, Irwin M. Korr, PhD, J.A. Chase, DO, F.T. Dun, DO, J.N. Eble, PhD, O.R. Gutenson, DO, E.L. Hix, PhD, R.W. Ho, DO., P. E. Thomas, DO, and H.W. Wright, DO. Basic and applied research on somatic dysfunction was carried out by members of this group during the next four decades which included investigation in reflexes, autonomic function, circulation, and body mechanics.

Some highlights of this research effort were Korr's work on axonal transport[2], which provided an explanation for observations of trophic function of nerves and implications for somatic dysfunction. Skin temperature measurements by Korr, Wright and Chase[3] identified segmental deviations from the normal in sweat patterns and skin temperature which were later correlated with evidence of somatic dysfunction. Eble[4] and Hix[5] demonstrated viscero-somatic, viscero-visceral and somato-visceral reflex effects in animals.

Additional basic research that should be noted is that of A. F. Kelso, PhD[6] at Chicago using thermography confirmed the relationship between somatic dysfunction and altered skin temperature. These changes have been related to alterations in cutaneous blood flow and have provided evidence of facilitated sympathetic activity, while Michael Patterson, PhD[7], at Ohio, has demonstrated the influence of the higher nervous system centers on reflexes and the role of the spinal cord in conditioned reflexes. His studies demonstrated spinal cord learning capability may have implications for the understanding of stable patterns of somatic dysfunction.

The research initiated by Denslow, Korr and the research team at Kirksville, has had a profound influence on the osteopathic profession. It broadened the conceptualization of the etiological mechanisms related to somatic dysfunction as well as its role in health and disease. It also represents a departure from the investigations in anatomy, body mechanics and the histopathology of the lesion. However, interest in joint mechanics and the adaptive responses of the body to injury, occupation and posture, has continued.

The early 1940s witnessed a number of activities. Strachan, Beckwith, Larson and Grant[8] published their study of the mechanics of the sacroiliac joint in 1938. Beckwith[9-13] wrote a series of articles on vertebral mechanics in 1944 in which he discussed concepts of spinal motion, lesion pathology and manipulative treatment. Bailey and Beckwith[14] published a paper on short leg and spinal anomalies in 1937. Beilke[15] wrote a paper on the mechanics of the sacrolumbar group in 1939, in which he described adaptations to a short lower extremity. Frederick Long[16] published his paper on spinal motion in 1940, detailing studies of the relationship of palpatory findings of joint motion with x-ray studies. Kerr, Grant and MacBain[17] described their observations of a study of the relationship of anatomical short leg and the treatment of low back pain in 1943.

These events in the early 1940s are significant as a part of general trends in osteopathic research or as initial steps in new directions. It was also the time of my introduction into osteopathic research as a student assistant to the Kerr low back study.

Posture

The adaptive response of the body to the upright posture and the body's response to gravitational stress has been a subject of study of consider- →

able interest in the osteopathic profession. Alexander McWilliams[18] (1931) identified a pattern of somatic dysfunction involving the lumbo-dorsal, cervical, thoracic and upper cervical spine. Harold Magoun[19] (1937) reported that lesion patterns were related to muscle tension and fibrosis secondary to pelvic disturbances. Lesions occurred at the site of the origin and insertion of the paraspinal muscles. He described these as weak points. Wesley Dunnington[20] (1964) noted that the musculoskeletal systems adaptive response to gravity predisposed the development of osteopathic spinal lesions. David Heilig[21] (1957) noted a high incidence of somatic dysfunction at or near transitional areas of the spine in his examination of 200 patients for evidence of postural patterns of altered vertebral mechanics.

With the advent of the standing postural x-ray in 1934, developed by Earl R. Hoskins,[22] a sudden impetus was given to the study of postural adaptation, short leg, and the standing x-ray procedure.

My early involvement in the low back research project at Chicago resulted in observations that the standing x-ray procedure as a research instrument had not been standardized, nor had the possible sources of error been assessed. The procedure was carried out in different ways in different x-ray departments. Measurements reported were not clearly identified as to their relative significance, for example, pelvic side shift.

My research duties were to carry out a structural examination of patients and record findings. The research office had a collection of x-rays of the patients in the study. Serial x-rays were taken of some patients who were on lift therapy, and I would study the before and after lift x-ray films to try and ascertain evidence of improvements.

It was apparent that adaptations of the pelvis to short lower extremity included a pelvic side shift, pelvic rotation, pelvic tilt and other possible movements. A study of the effect of side shift by x-ray showed that shifting the pelvis towards the long leg compensated for part of the femur top height difference. X-rays of the talus height in the standing position demonstrated that in some instances the difference of the talus was equal to the difference at the femur top.

I summarized these findings along with a review of the literature in 1950.[23] This was followed by a definitive study by Denslow[24] in 1955, outlining the sources of error in the x-ray procedure. He later identified the various adaptations of the lumbar spine and pelvis to leg length differences.[25] This study was followed by a study by Thomas[26] who analyzed the interactions of the pelvis and lumbar spine and found that the most frequent pattern in 713 individual studies was a low femur, low iliac crest and low sacral base on the right and the left sides.

In 1967, Thomas[27] employed EMG to analyze muscle activity of the torso, hip and leg in standing patients, which showed that the greatest muscle activity in individuals with a short leg was in the high and low paravertebral muscles, the tensor fascia lata and hamstrings on the side of the long leg.

A significant study of the progressive effects of posture was conducted by Pearson[28] in 1951. A total of 831 children were given physical and structural x-ray examinations to determine the incidence of short leg, lumbosacral angle, lumbar curvature and pelvic accommodation. One hundred x-rays taken two years later, were compared with the original films. Pearson noted that, with the exception of arthritis, all structural problems visualized in standing structural film studies of adults were present in children between the ages of 5 and 18.

Hagen[29] examined 50 individuals from the Pearson study 10 to 15 years later. He observed that 44% had similar childhood and adult spinal curves, only 20% demonstrated a change in the relationship of sacral tilt to leg length. He concluded that the pattern of axial skeletal morphology was established at an early age; that apparent leg length differences tend to increase with age, and pelvic morphology characterized by leg length related to sacral tilt changed only slightly.

There are still unanswered questions in regard to the short leg problem. I am glad to report that there is a move at present to standardize the postural x-ray study. However, we do not have a detailed correlation between x-ray and physical findings. We do not know what are the effects of lift therapy over time - are they beneficial or do people develop compensatory problems to lift therapy? Adaptive pelvic mechanics include sideshift, rotation and tilt. Do these movements take place in a prescribed manner and degree as the pelvis adapts to differences in leg length? How do you account for the symptomatic improvement in patients who are treated by manipulation and lift therapy? An answer to some of these questions would provide us with knowledge for a more informed judgment in the treatment of postural problems.

Joint Motion

Studies of joint motion date from the paper by Fryette[30] on the Physiological Movement of the Spine in 1918. Subsequent studies include those of Beckwith of vertebral mechanics[9] published in 1944 in which he described normal and abnormal joint motion.

Frederick Long,[16] in 1940, studied the incidence of spinal findings in patients entering the clinic, and the relationship of spinal findings to a

diagnosis of visceral disease. He attempted to correlate palpatory findings of joint motion restriction of the cervical spine with x-ray evidence of decreased mobility as ascertained by x-rays in the positions of neutral, flexion and extension.

Strachan, Beckwith, Larson and Grant[8] studied the mechanics of joint motion of the sacroiliac joint by using cadaveric material and immobilizing one ilium in a concrete block, permitting movement at the symphasis pubis. Steel pins 10 to 20 inches long were inserted in the ilia and sacrum at the levels of the first and fourth sacral segment. A method of recording movement of the pins was devised as movements of flexion, extension, rotation and sidebending, traction and compression, were introduced through the lumbar spine. It was determined that the sacrum is capable of flexing, extending, lateroflexing and rotating in relation to the ilia. When rotation is introduced into the sacrum, lateroflexion occurs to the opposite side. When lateroflexion was introduced, rotation occurred to either side.

J. Marshall Hoag,[31] working with Paul Rosenberg,[32] began a study of spinal motion employing the R center method of analyzing vertebral motion from x-rays. Five x-rays were taken in different positions in the antereoposterior plane, and four x-rays in different positions in the lateral plane. Motion was then described in terms of rotation and translation components. It was observed that the magnitude of these movements was variable. Some vertebra appeared to follow a smooth continuous path of movement in a given direction, whereas others displayed erratic unstable behavior with several shifts in motion in different directions.

In the late 1950s, I had been invited to explore the use of cineradiography at the University of Rochester in some of my patients with cervical spine problems. The chief engineer for the development of this modality had been a patient in my office. At the time cineradiography was largely used for lateral cervical spine x-rays because of the limitations of the procedures, x-ray penetration and exposure.

Beckwith proposed that we do a study of spinal motion using Cathie's Halladay spine. Cathie was in agreement. Beckwith, I, Cathie and John Chase[33] from Kirksville undertook a study of x-ray motion pictures of the cervical, thoracic and lumbar spine to see if we could gain an understanding of the normal mechanics of spinal movement. Movements were introduced by hand. Where movement was carried out in three planes, only the last plane of movement was x-rayed since we found out that x-raying the total movement created excessive heat in the x-ray tube; a problem we had not anticipated.

The range and quality of movement was observed, particularly the facets and vertebral bodies. Fryette had emphasized the role of the facets in determining spinal motion. It was observed that segmental motion in flexion, extension and lateral flexion occurred, but that rotation movement was columnar without any visible segment-to-segment motion. Facet motion was difficult to see in contrast to the evident gross motion of the vertebra. The facets appeared to play a minor role in qualifying vertebral motion. It was observed that the prior introduction of motion in one plane limited subsequent movement in another plane. We were told that this is Fryette's third law, but I am unable to find any reference to this in his paper of 1918. However, this has practical clinical applications to the use of manipulative techniques. I find that beginning students, after introducing flexion or extension, tend to use excessive rotation and sidebending when attempting to localize their forces at the site of somatic dysfunction.

Robert Ho, in 1961, examined 13 adult spinal preparations and determined the arc of motion at the interspinous interval. He found that the greatest range of movement occurred in the cervical spine, followed by the lumbar and thoracic areas. Dr. Ho explored the clinical implications of the art of intervertebral joint motion testing and concluded that palpable observations of intervertebral joint motion tend to parallel x-ray quantification.

Stereoradiography was used by Herbert Reynolds in 1980[35] to study motion of the sacrum in relation to the innominates when the femur was placed in different positions. Tungsten carbide balls are inserted in specific areas of the skeleton as landmarks, providing a fixed axis system whereby distances between landmarks can be calculated. Reynolds observed that rotation motions in the sacroiliac joint were small in comparison to rotation motions in the hip and that the hip and sacroiliac joints did not maintain a constant relationship in the amounts of translation and rotation. Subsequent to this study, the data derived from stereometric analysis of spinal motion have been used to develop a computer graphic simulation of vertebral motion.

There are several elusive questions that remain unanswered in regard to joint motion. Since one of the measures of patient improvement is an increase in the range or quality of movement, it would be helpful to know. What constitutes restricted motion? Is it within the voluntary range of motion of the joint or the involuntary range of motion, or both? What degree of change in joint motion is associated with symptomatology? What is the correlation between the palpatory tests of motion and actual motion in the joint? Is the range of motion actually improved after treatment? Can we establish the reliability of palpatory joint motion testing as a valid research examination procedure?

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Histological and Tissue Studies

Wilbur Cole was given an AOA research grant to enable him to work with Louisa Burns in California from 1949 to 1951. He then returned to Kansas City College of Osteopathic Medicine where he continued histological studies involving the motor endplate and somatovisceral reflexes. Studies included various methods of creating lesioning in animals and studying their effects, compared to controls.

Wilbur Cole's work marks the last of the major histological studies completed in attempts to gain information at the cellular level of the effects of somatic dysfunction.

Dr. Cole told me he considered that his work, and that of Burns and Deason, had resulted in similar observations and he felt that particular line of research had been adequately explored. It remains to be seen whether the present histological work at this college will provide us with new insights into the mechanisms of somatic dysfunction.

Questions involving the mechanical response of connective tissues to loading and deformation have been the subject of research by Robert Hubbard[36-37] at Michigan State University. Tissue responses have been classified as nonlinear and viscoelastic. Nonlinear is defined as tissue stiffness that increases with increasing deformation, resulting in a barrier that can be perceived by a clinician. Viscoelasticity is defined as tissue responses that involve energy storage with an elastic return and dissipation of energy. The studies of nonlinear and viscoelastic properties of tissue have shown that changes which allow greater movement with reduced force or reduced restriction to motion occurred following the first few tissue extensions, and within seconds of extension, but the changes persisted for several hours. These phenomena have interesting implications for the use of manipulative procedures.

Studies of Manipulation on Physiological Function

A number of studies have been conducted to determine the effects of manipulation on body function. These have included studies of pulse rate, blood pressure, blood flow, motor activity, skin temperature, and intraoccular pressure. Long and Deming[38] observed the effects of manipulation of the cervical spine on blood pressure and pulse rate in 30 normal college students compared with 30 control subjects. Although a decrease was noted in pulse rate and systolic and diastolic blood pressure, the results were not statistically significant.

Celander[39] noted that there was a decrease in blood pressure in hypertensive and normal patients after soft tissue manipulation of the upper thoracic and cervical vertebra. Celander[40] further noted an even greater effect on blood pressure occurred after four or five manipulative treatments than after a single treatment.

The effect of manipulation on blood flow was ascertained by using an electrical impedance plethysmograph. One experiment showed that a greater effect on blood flow was obtained when active corrective treatment followed the use of myofascial release techniques.[41]

England[42] and Heilig,[43] in separate studies, showed that motor activity ascertained by EMG was reduced after manipulation which correlated with palpatory findings of a decrease in segmental rigidity. England[44] also used crystallography to show changes in skin temperature associated with somatic dysfunction were decreased following manipulative treatment. Kelso,[45] using thermography, also showed a decrease in skin temperature after successive manipulative treatments.

For the most part, the studies of the effect of the body response to manipulation have been conducted on normal subjects in limited time intervals. An intriguing question is what would be the effects from successive treatments over a period of time, particularly as it relates to clinical conditions such as hypertension. Do changes occur that are not apparent after one treatment? If changes do occur, how long do they last? Such questions are not only pertinent to trials of the effect of manipulative treatment on physiological parameters, but even more important, to the effects of manipulative treatment on specific clinical conditions such as hypertension.

There are few clinical trials reported in the osteopathic literature. One of the early ones was that of Perrin T. Wilson[46] on the effects of osteopathic treatment on patients who had had vaccine treatment for asthmatic bronchitis. He reported 15 patients out of 20 subjects experienced some temporary relief, and that 10 patients had 50% fewer asthmatic attacks or less severe symptoms.

Howell[47] reported a study of 17 patients with chronic obstructive lung disease whose pulmonary function tests were monitored for a period of nine months as they were given manipulative treatment. Improved statistical significance was observed in PCo2 levels, oxygen saturation, total lung capacity and residual volume.

Miller[48] reported on a controlled study of manipulative treatment given to patients with chronic obstructive lung disease. Changes observed in vital capacity and residual volume for a treated group were not statistically significant, although the test group reported improved work capacity, had less dyspnea and developed fewer colds and upper respiratory infections.

The early studies of the effectiveness of manipulative treatment in cardiovascular disease should be classed

as examples of clinical observation. They were not controlled studies. Recent studies in this area have been directed toward the identification of palpatory findings of somatic changes that are associated with cardiovascular disease, studies by Cox,[49] Beal[50] and DeBias.[51]

Despite the frequent references to the effectiveness of manipulative treatment of musculoskeletal dysfunction, few well designed clinical trials have been reported. Hoyt[52] observed that patients with muscle contraction headaches, who were given a palpatory examination and manipulation, rated head pain as significantly less severe than patients who had a palpatory examination alone or those who were instructed to rest in a supine position. EMG measurements of the frontalis muscle did not show a consistent change in the experimental groups.

Siehl[53-54] reported two studies of the results of manipulation under anesthesia. In one series 96.3% of patients with a diagnosis of myofibrositis had a favorable response to treatment, whereas only 70.7% of the patients who had a diagnosis of a herniated disc showed improvement. In a second series, the results showed that manipulation under anesthesia produced a lasting improvement when EMG showed no evidence of nerve root compression, but only temporary improvement when EMG findings were positive for root compression.

Larson[55] reported a double-blind clinical study of the effect of manipulative treatment with peripheral nerve complaints. A therapeutic response was noted in 16 out of 19 patients and was associated with an improvement in skin temperature of the affected limbs.

Beal, Johnston, and Vorro[56] have shown a correlation between the patient's subjective complaint, physician findings, and a standardized measurement of electrical activity of the cervical spine musculature in four patients with chronic cervical spine injury. Parallel improvements in the patient health status were observed following the use of manipulative treatment.

The Clinicians Research Group at MSU

In 1974, I joined the faculty at MSU and was appointed to the Department of Biomechanics. The Department was composed of osteopathic physicians and basic scientists. The initial conceptualization of the Department was that the placing of physicians and basic scientists in physical juxtoposition would facilitate and lead to the development of research basic to osteopathic theory and practice.

Shortly after I arrived, I organized a clinicians research group of the five physicians in the Department. Soon, thereafter, basic scientists were added to the group. The research group met weekly for several years. It provided a forum for the discussion of osteopathic concepts, osteopathic diagnostic and treatment protocols to engage the basic scientists in a dialogue of possible research designs to attempt to correlate clinical practice with objective tests. There were several positive outcomes: 1) the osteopathic physicians gave the basic scientists a better understanding of osteopathic philosophy and practice, not only from a philosophical standpoint, but also from the practical hands-on experience of palpation and treatment; 2) the osteopathic physicians were educated in the principles of research design and research protocols such as the importance of engaging the statistician early in the design phase of a research project, the critical review of all details of research design prior to data collection, the need for a pilot study to critique and perfect the research design. Another important observation for the clinicians was that diagnostic tests which were shown to have poor interrater reliability were being taught in an unquestioning manner in the college curriculum. Unfortunately, I cannot say that the implications of the research were translated into improvements in the students education.

The clinicians research group engaged in a number of trials of interrater reliability of palpatory tests, as well as exploring the correlation between palpation and objective tests. The group as a whole was involved in formal studies such as the low agreement of findings in neuro-musculoskeletal examinations.[57] The classification of diagnostic tests used with osteopathic manipulation,[58] and the description of 50 diagnostic tests[59] used with osteopathic manipulation.

The study resulting in the publication of low agreement of findings in neuromusculoskeletal examinations was based upon a review of the examination of 21 patients. Patients entering a clinic were given a structural examination which was recorded. Two other physicians were then called to conduct a structural examination without a knowledge of the patient's history. Each examiner utilized his own testing procedures and recorded his findings. The comparison of the results of the examinations showed poor correlation in the identification of the sites of somatic dysfunction. The significance of the study is that to obtain good interexaminer reliability special attention must be paid to training of examiners in testing procedures and the selection of tests. This was shown by the study of interexaminer agreement on patient improvement[60] in which three examiners independently examined the patient, then met with the patient to negotiate the tests to be used in evaluating the patient's condition. Each testing protocol was detailed so that the examiners were in relative agreement in the conduct of the test. The results of this study dem-

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onstrated that interexaminer agreement in testing could be achieved by using a precise research design. In addition, it was shown that there was interexaminer agreement on improvement of patients following the use of manipulative treatment.

The classification of diagnostic tests used in the osteopathic musculoskeletal examination[58] was instigated by Dinnar who was intrigued by the differences in an osteopathic examination in contrast to his experience with a medical examination. Videotapes were made of five clinicians, each examining and treating three different patients. These were subjected to detailed study to define the testing process conducted by the examiners. Dinnar classified the tests in five categories.

1. General Impression Tests
2. Regional Motion Test
3. Position of Landmarks
4. Superficial and Deep Tissue Evaluation
5. Local Response to Motion Demand

Dinnar stated that the first three categories are common to medical practice, but categories 4 and 5 are unique to the osteopathic profession. This study is important as it was the first time that the testing process in a structural examination has been delineated and described in terms of individual tests.

Other studies reviewed by the group were those carried out by Johnston[61] on palpation, interrater reliability, the stability of findings; Upledger[62] on reproducibility of cranial sacral examination findings, and Beal[60] on interexaminer agreement on patient improvement.

Meetings of the research group were held with Albert Kelso to discuss possible collaborative efforts between MSU and Chicago. This resulted in a listing of research questions, which formed the basis of discussions of research designs.

Research Projects

A. Patterns of Findings and Their Significance
   1. What are findings and how are they observed?
   2. What is the natural cycle of findings?
   3. What are the common patterns of findings?
   4. How stable are findings?
   5. What are stable findings and to what do they relate?
   6. What are unstable findings and to what do they relate?
   7. Do findings precede the development of disease?
   8. Do findings result from disease?
   9. What is the incidence of findings in a population, i.e. different age groups, occupations?
   10. What is the incidence of findings in relation to certain diagnostic entities?
   11. Can findings be quantified?
   12. How do findings compare with other predictors of illness such as history, physical signs, laboratory data, response to therapy?
   13. Can the energy cost of somatic dysfunction be measured?

B. Manipulative Treatment
   1. What are the criteria for the use of manipulative therapy?
   2. Is manipulation superior to other forms of therapy and for what patients?
   3. How can the effectiveness of manipulation be evaluated?
   4. What are the mechanisms of body response to manipulative therapy?
   5. What response does manipulative therapy produce initially - later?
   6. How do you determine a favorable response to manipulation?
   7. How good is the physician's prediction of results of manipulation - a single visit, long-range?
   8. What is an adequate time interval between treatments to produce maximum results?
   9. What are the contraindications to the use of manipulation?
   10. How is dosage of manipulation determined?

The collaborative research efforts between the two schools were confined to Johnston's work with Kelso on palpatory findings associated with hypertension, and my study of palpatory findings in cardiac patients. Other studies with clinical implications, which have evolved in the Biomechanics Department has been those on tissue properties by Hubbard, and spinal motion by Herbert Reynolds using stereometric x-ray studies of cadavers.

Research Design

An important result of the growth in clinical research efforts during the last decade was a realization that steps needed to be taken to improve osteopathic research design. Osteopathic clinical research often lacked adequate descriptions of the diagnostic tests utilized, the findings before intervention, the treatment instituted, and the findings after intervention.

In November of 1985, Dr. Anthony G. Chila chaired a meeting of an Ad Hoc Committee of the AOA Bureau of Research to discuss the recording of musculoskeletal findings. Those present at the meeting were Anthony Chila, Myron Beal, John Goodridge, William Johnston, Robert Kappler, Albert Kelso, Michael Patterson and David Rivers from the AOA Bureau of Research.

The results of the Ad Hoc Committee were a series of recommendations for osteopathic research, which if adopted would ensure a basic uniformity of research design for studies involving osteopathic manipulative treatment. It was recommended

that the criteria for a research study to evaluate osteopathic manipulative treatment should include:

1. A musculoskeletal examination with:
   a. descriptions of the tests utilized to determine the presence or absence of somatic dysfunction,
   b. the criteria for positive findings,
   c. a description of the findings relating to the assessment of somatic dysfunction.
2. A preliminary musculoskeletal diagnosis.
3. Intervention (osteopathic manipulative treatment)
   a. based on the test findings,
   b. the objective of treatment,
   c. a description of the treatment procedure(s) used.
4. Reassessment
   a. a reevaluation of findings, utilizing the original tests used to determine the presence of somatic dysfunction.
5. Documenting the effects of osteopathic manipulative treatment
   a. local musculoskeletal effects
   b. remote musculoskeletal effects
   c. other effect
      1) behavior
      2) visceral
      3) communicating.

The adoption of these criteria by the AOA Bureau of Research would set criteria for the review of research projects for acceptance and funding. It would raise the level of osteopathic research by insuring basic standards for research design. It would ultimately determine the criteria for acceptance by the JAOA for publication. Such steps could only result in better osteopathic clinical research.

Summary

I have tried to give you an overview of the research directions since 1940. There are certain themes:

1) physiological research in neurophysiology, facilitation, axonal transport, circulation, autonomic control,
2) body adaptive responses, posture, short lower extremity,
3) joint mechanics,
4) the effects of manipulation on the body and,
5) clinical trials of the effect of manipulative treatment.

Some of the studies that have been done need to be repeated for confirmation or clarification. Studies are needed which introduce the dimension of time so that observations simulate clinical experience. We need to examine further the art of palpatory diagnosis and treatment and try and answer some of the basic questions in terms of effectiveness and reliability of results. It is time for the profession to require minimum standards of conformity in osteopathic research design.

Bibliography

1. Denslow, J.S. and Clough, H.G.: Reflex activity in the spinal extensors. J. Neurophysiol. 4:430-7, 1941.
2. Korr, I.M., Wilkinson, P.N., and Chornok, F.W.: Axonal delivery of neuroplasmic components to muscle cells. Science 155:342-5, 1967.
3. Korr, I.M., Wright, H.M., and Chase, J.A.: Cutaneous patterns of sympathetic activity in clinical abnormalities of the musculoskeletal system. Act. Neurology 25:589-606, 1964.
4. Eble, J.N.: Patterns of response of the paravertebral musculature to visceral stimuli. Am. J. Physiol. 198:429-33, Feb 1960.
5. Hix, E.L.: Segmental and supre-segmental reflex influences on renal function. JAOA 66:999, May 1967.
6. Kelso, A.F. and Johnston, W.L.: A pilot study on measurement of skin temperature. JAOA 80:754, Jul 1981.
7. Patterson, M.: Louisa Burns Memorial address. The spinal cord - Active processor not passive transmitter. JAOA 80:210-6,1980.
8. Strachan, W.F., Beckwith, C.G., Larson, N.J., and Grant, J.H.: A study of the mechanics of the sacroiliac joint. JAOA 37:576-8, Aug 1938.
9. Beckwith, C.G.: Vertebral mechanics. JAOA 43:226-31, Jan 1944.
10. Beckwith, C.G.: Cervical mechanics. JAOA 43:384-8, May 1944.
11. Beckwith, C.G.: Thoracic vertebral mechanics. JAOA 43:436-9, Jun 1944.
12. Beckwith, C.G.: Lumbar mechanics. JAOA 43:491-4, Jul 1944.
13. Beckwith, C.G.: Pelvic mechanics. JAOA 43:549-52, Aug 1944.
14. Bailey, H.W. and Beckwith, C.G.: Short leg and spinal anomalies. JAOA 36:319-27, Mar 1937.
15. Beilke, M.C.: Simple mechanics of the sacro-lumbar group. JAOA 39:165-7, Nov 1939.
16. Long, F.A.: Some observations on spinal motion. JAOA 39:405-15, May 1940.
17. Kerr, H.E., Grant, J.H., and MacBain, R.N.: Some observations on the anatomical short leg in a series of patients presenting themselves for treatment of low-back pain. JAOA 42:437-40, Jun 1943.
18. McWilliams, A.F.: Combination lesions. JAOA 30:239-40, Feb 1931.
19. Magoun, H.I.: Basic lesions. JAOA 36:453-6, Jun 1937.
20. Dunnington, W.P.: A musculoskeletal stress pattern: Observations from over 50 years clinical experience. JAOA 64:366-71, Dec 1964.
21. Heilig, D.: Patterns of Still lesions and an evaluation of some diagnostic criteria in altered vertebral postural patterns. Thesis prepared for Master of Science degree, Philadelphia College of Osteopathy, 1957.
22. Hoskins, E.R.: The development of posture and its importance: III. Short leg. JAOA 34:125-6, Nov 1934.
23. Beal, M.C.: A review of the short leg problem. JAOA 50:109-21, Oct 1950.
24. Denslow, J.S., Chase, J.A., Gutensohn, O.R., and Kumm, M.G.: Methods in taking and interpreting weight-bearing x-ray film. JAOA 54:663-70, Jul 1955.
25. Denslow, J.S., Chase, J.A., Gardner, D.L., and Banner, K.B.: Mechanical stresses in human lumbar spine and pelvis. JAOA 61:705-12, May 1962.

→

26. Thomas, P.E.: An analysis of the interaction among various asymmetric osseous pelvic and lumbar structures. JAOA 64:956-7, May 1965.

27. Thomas, P.E.: Patterns of muscle activity in the legs, hips and torso associated with quiet standing. JAOA 72:58-9, Sep 1972.

28. Pearson, W.M.: A progressive structural study of school children. JAOA 51:155-67, Nov 1951.

29. Hogen, D.P.: A continuing roentgenographic study of rural school children over a 15-year period. JAOA 63:546-57, Feb 1964.

30. Fryette, H.H.: Physiological movements of the spine. JAOA 18:1-2, Sep 1918.

31. Hoag, J.M., Kosak, M., and Moser, J.R.: Kinematic analysis and classification of vertebral motion. JAOA 59:982-6, Aug 1960.

32. Rosenberg, P.: The R-center method. A new method for analyzing vertebral motion by x-rays. JAOA 55:103-11, Oct 1944.

33. Beal, M.C. and Beckwith, C.G.: Studies of vertebral motion: I. Cineradiographic studies on the Halladay Spine. JAOA 63:319-23; II. Clinical applications. JAOA 63:323-5, Dec 1963.

34. Ho, R.W.H.: Testing intervertebral joint movement. JAOA 61:635-9, Apr 1962.

35. Reynolds, H.M.: Three dimensional kinematics in the pelvic girdle. JAOA 80:277-80, Dec 1980.

36. Hubbard, R.P. and Sacks, M.S.: Mechanical response of collogenous tissue to repeated elongation. JAOA 83:73, Sep 1983.

37. Hubbard, R.P. and Chan, K.J.: Mechanical responses of tendons to repealed extensions and wait periods. Proceedings of the 1985 Biomechanics Symposium, American Society of Mechanical Engineers. AMD, Vol. 68, Fed. Vol. 21, 1985.

38. Long, F.A., and Deming, G.S.: The effects on the blood pressure and pulse rate of soft tissue manipulation combined with sudden spinal joint mobilization in the cervical region in a group of "normal" college students. JAOA 42:185-7, Dec 1942.

39. Celander, E., Koenig, H.J., and Celander, D.R.: Effect of osteopathic manipulative therapy on autonomic tone as evidenced by blood pressure changes and activity of the fibrinolytic system. JAOA 68:1036-8, Jun 1969.

40. Borown, T., Celander, E., and Celander, D.R.: A proposed mechanism for osteopathic manipulative therapy effects on blood pressure. JAOA 69:1035-6, Jun 1970.

41. Marcus, A.J., and Kerms, I.D.: Effect of osteopathic manipulative techniques upon blood flow using the electrical impedence plethysmograph. JAOA 68:1047-51, Jun 1969.

42. England, R.W., and Deibert, P.W.: Electromyographic studies: Part I. Consideration of the evaluation of osteopathic therapy. JAOA 72:221-3, Oct 1972.

43. Heilig, D., Greene, C., and Arbizo, M.: Quantitation of segmentally related peripheral effect of manipulation on somatic dysfunction in vertebral areas. JAOA 83:69-71, Sep 1983.

44. Deibert, P.W. and England, R.W.: Crystallographic study: Thermal changes and the osteopathic lesion. JAOA 172:223-6, Oct 1972.

45. Kelso, A.F., Grant, R.G., and Johnston, W.L.: Use of thermograms to support assessment of somatic dysfunction or effects of osteopathic manipulative treatment: Preliminary report. JAOA 82:182-8, Nov 1982.

46. Wilson, P.T.: Experimental work in asthma at the Peter Brent Brigham Hospital. JAOA 25:212-4, Nov 1925.

47. Howell, R.K., Allen, T.W., and Kappler, R.E.: The influence of osteopathic manipulative therapy in the management of patients with chronic obstructive lung disease. JAOA 74:757-60, Apr 1975.

48. Miller, W.D.: "Treatment of visceral disorders by manipulative therapy" in the Research Status of Spinal Manipulative Therapy (Bethesda, MD: U.S. Dept. of Health, Education and Welfare) 1975, pp 295-301.

49. Cox, J.M., Gorbis, S., Dick, L.M., Rogers, J.C., and Rogers, F.J.: Palpable musculoskeletal findings in coronary artery disease: Results of a double-blind study. JAOA 82:832-6, Jul 1983.

50. Beal, M.C.: Palpatory testing for somatic dysfunction in patients with cardiovascular disease. JAOA 82:822-31, Jul 1983.

51. Nicholas, A., DeBias, D.A., Ehrenfeuchter, W., England, K.M., England, R.W., Greene, C.H., Heilig, D., and Kirschbaum, J.: A somatic component to myocardial infarction. Brit. Med. J. 291:13-17, Jul 1985.

52. Hoyt, W.H., Shaffer, F., Bard, D.A., Beinesler, J.S., Blankenhorn, G.D., Gray, J.H., Hartman, W.T., and Hughes, L.C.: Osteopathic manipulation in the treatment of muscle contraction headache. JAOA 78:322-5, Jan 1979.

53. Siehl, D.: Manipulation of the spine under general anesthesia. JAOA 62:881-7, Jun 1963.

54. Siehl, D., Olson, D.R., Ross, H.E., and Rockwood, E.E.: Manipulation of the lumbar spine with the patient under general anesthesia: Evaluation by electromyography and clinical-neurological examination of its use for lumbar nerve root compression syndrome. JAOA 70:433-40, Jan 1971.

55. Larson, N.J., Walton, M.W., Huitt, H.H., and Kelso, A.F.: A double-blind clinical study of the effects of manpulative treatment of patients with peripheral nerve complaints. JAOA 76:209, Nov 1976.

56. Beal, M.C., Vorro, J., and Johnston, W.L.: A correlation of myoelectric findings with clinical progress in patients with chronic cervical dysfunction: A pilot study. Submitted for publication.

57. McConnell, D.G., Beal, M.C., Dinnar, U., Goodridge, J.P., Johnston, W.L., Karni, Z., Upledger, J.E., and Blum, G.: Low agreement of findings in neuromusculoskeletal examinations by a group of osteopathic physicians using their own procedures. JAOA 79:441-50, Mar 1980.

58. Dinnar, U., Beal, M.C., Goodridge, J.P., Johnston, W.L., Karni, Z., Mitchell Jr., F.L., Upledger, J.E., and McConnell, D.G.: Classification of diagnostic tests used with osteopathic manipulation. JAOA 79:451-5, Mar 1980.

59. Dinnar, U., Beal, M.C., Goodridge, J.P., Johnston, W.L., Karni, Z., Mitchell Jr., F.L., Upledger, J.E., and McConnell, D.G.: Description of 50 diagnostic tests used with osteopathic manipulation. JAOA 81:314-21, Jan 1982.

60. Beal, M.C., Goodridge, J.P., Johnston, W.L., and McConnell, D.G.: Interexaminer agreement on patient improvement after negotiated selection of tests. JAOA 79:432-40, Mar 1980.

61. Johnston, W.L., Elkiss, M.L., Marino, R.V., and Blum, G.A.: Passive gross motion testing: Part II. A study of interexaminer agreement. JAOA 81:304-8, Jan 1982.

62. Upledger, J.E.: The reproducibility of craniosacral examination findings: A statistical analysis. JAOA 76:890-9, Aug 1977.❒

From the AOBNMM Files:

(Certifying Board formerly known as AOBSPOMM)

Case Study: OMT and Chronic Cephalgia

by Carole S. Brown, DO, CSPOMM, Jefferson City, MO

Patient Identification:

CC, a 29-year-old female

Chief Complaint:

Chronic Cephalgia

History of Chief Complaint

CC presents to the clinic complaining of chronic headaches. Onset was approximately one year ago and she can recall no associated events or trauma. Her headaches occur intermittently, approximately two or three times a week. They begin in the frontal bone area and progress to encompass the entire cranium especially at the occipital bone. She describes the pain as either a throbbing ache or burning and dull. These headaches have awakened her at night. No provocative or palliative factors are recalled. She has nausea with the headaches but denies aura symptoms and photophobia. She also denies loss of coordination, vision changes, muscle weakness, and seizures.

Past Medical History:

Negative other than as stated above.

Past Surgical History:

Tonsillectomy at age eight and removal of three benign breast cysts at age eighteen.

She also admits to a fractured coccyx as a result of a fall onto her buttocks into a twelve-foot empty swimming pool. Her father never allowed her to tell her mother.

Social History:

She is a nondrinker, nonsmoker, and self-employed as a custom framer and photographer. She is married to a physician and lives with her husband and two "challenging" daughters.

Allergies:

No known drug or seasonal allergies.

Medications:

Tylenol 500 mg two every four hours as needed and ibuprofen 400 mg three times a day.

Review of Systems:

General: good health, no recent change in weight or sleeping habits. Head: as in chief complaint, mandible deviation 4mm to the left, orthodontics applied 13 months ago with monthly adjustments.

Eyes: no changes in vision, trauma, or pain.

Ears: negative.

Nose: frequent nasal congestion, pain in the frontal and maxillary sinuses with infections several times a year.

Throat and neck: negative.

Cardiovascular and Pulmonary: negative.

Gastrointestinal: no change in bowel habits, dyspepsia, or reflux.

Genitourinary: no infections, no renolithiasis, menses normal duration, amount, and no association with headaches.

Musculoskeletal and neurologic: negative other than as stated in chief complaint. Endocrine, hematopoietic, and psychiatric are all negative.

Physical Exam:

General: CC is a well-developed, well-nourished 29 year old female, who is alert, cooperative, and in no distress. Vital signs: temperature 98.4, pulse 80, respiration 20, blood pressure 110/70, height 5 feet 2 inches, weight 114.

Head: mandible bone deviated to the left relative to the maxilla.

Eyes: pupils equally round and reactive to light and accommodation, extra ocular muscles intact, fundoscopic: no hemorrhages or exudates.

Nose: clear, no sinus tenderness.

Mouth: Orthodontic appliances in place.

Throat and neck: negative.

Cardiovascular: no murmurs or ectopic beats.

Pulmonary: clear to auscultation.

Gastrointestinal: negative.

Musculoskeletal: mandible bone deviates left upon opening with crepitus noted in the right temporomandibular joint (TMJ) otherwise no muscle atrophy or weakness. Neurologic: cranial nerves I- XII intact, upper extremity DTRs 2/4, coordination intact.

Structural: standing posture right shoulder inferior, right iliac crest inferior, increased cervical lordosis, thoracic kyphosis, and lumbosacral angle.

continued on page 38

Book Review

by Michael A. Seffinger, DO, FAAFP, CSPOMM

The Muscle Energy Manual:

Evaluation and Treatment of the Thoracic Spine, Lumbar Spine, and Rib Cage Volume Two

by Fred L. Mitchell, Jr. and P. Kai Mitchell

So many medical students and physicians have difficulty problem solving when it comes to the musculoskeletal system because of lack of an organized rational approach to evaluation and treatment. This book will enable the student and teacher of manual diagnostic and treatment procedures to develop a solid framework and sophisticated skills second to none. It succinctly covers pertinent articular anatomy and biomechanics, respiratory motion and evaluation and treatment procedures using muscle energy concepts developed by Drs. Fred L. Mitchell, (Sr. and Jr). Key concepts are summarized in well designed tables and graphic drawings done so clearly that they can easily be used in lectures by instructors to get these crucial points across. Black and white photos depicting evaluation and treatment procedures are clear and accurate and enhance the text and drawings well. Explanations of procedures are very articulate and easily understood. Interspersed are quotes from experts in the field as well as discussion of controversies in the current medical literature.

The descriptions are as accurate as possible, stating positions in three planes, amount of movement in millimeters, amount of force in pounds and the duration of activity in seconds. Clinical cases, problem solving, differential diagnosis and organization of examination and treatment procedures are additional components of this manual that set it apart from any other book on manual medicine in print today. Clinical indications and precautions are clearly delineated and clinical pearls derived from Dr. Mitchell's 40 years of intimacy with these procedures in clinical practice are abundant. Also included are the historical developments of the various techniques that provide insight into their applicability and effectiveness.

Since muscle energy procedures enlist the patient's activation of muscle force, it is necessary to use very accurate commands to get the patient to move exactly how the practitioner wants in order to increase the effectiveness of the procedure. Thankfully, Dr. Mitchell provides the learner and instructor with the words to use to instruct patients properly. These particular commands have proven themselves over the decades as being most effective and succinct.

It is also interesting to note that the evaluation and treatment procedures taught in this manual have become standard in all of the American osteopathic medical schools. They are taught around the world and formulate integral components of the curricula at foreign osteopathic colleges and institutions as well. They are rationally based, logically sequenced, and easily learned and reproduced.

It is my opinion that the true gem of this manual is that one fourth of its 223 pages is devoted to diagnosis and treatment of rib dysfunctions. This is the most complete and authoritative dissertation on this part of the body that I could find in the current world literature. Having learned these procedures from Dr. Mitchell while in medical school at Michigan State University College of Osteopathic Medicine 1983-88, I have used them for 15 years in clinical practice. They are amongst the most useful and effective procedures ever designed for evaluation and treatment of patients of all ages with costal cage dysfunction.

The main drawback I have found in using this manual is that it lacks an index at the end. There are times when I want to know what is written on a topic or a term and I have to thumb through a chapter or two to find it. Although the book does have a detailed table of contents and a separate list of diagnostic and treatment procedures, an index would be a welcome addition to the second edition.

This book is a "must have" for practitioners using manual diagnostic and treatment procedures for the thoracic and lumbar spine and costal cage. It will no doubt establish itself as one of the classic books to come out of the last century and yet it is truly a guiding light for the 21st century and new millennium.

[Note: The Muscle Energy Manual, Volume Two, can be ordered from the publisher: MET Press, P.O. Box 4577, East Lansing, MI 48826-4577. Fax: (517) 332-4196. Volume Three covering evaluation and treatment of the pelvis and sacrum is now available.]❐

Lift Treatment in Naval Special Warfare (NSW) Personnel: A Retrospective Study[a,b]

by CDR James A. Lipton, MC, USNC ; LT John S. Brooks, MC, USNd ;ENS (SEAL) Matthew J. Hickey, MC, USNRe
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Abstract

As in the civilian population, low back pain (LBP) is a common complaint among Navy personnel seeking medical attention. After a thorough history and physical examination, some NSW personnel presenting with LBP to the medical department of Special Boat Squadron TWO (SBR-2) in Norfolk, VA, were found to have a leg length inequality (LLI) or physiologically "short leg." Thirty-five of these individuals were treated with a heel lift. The lift was placed in the shoe corresponding to what was determined to be the "short leg" side. These individuals experienced either complete or significant relief of their musculoskeletal complaints.

Key words

leg length inequality, lift treatment, short leg, sacral base unleveling, low back pain, anisomelia)

Introduction

Some researchers report that LBP affects up to 80% of people at some time in their life.[1] Consequently, LBP is responsible for more loss in productivity than any other ailment and is the second leading cause of missed work days (respiratory infections is number one).[2] Unfortunately, back pain can have a multifactorial etiology and providing a specific diagnosis can be complicated.[3] LBP which is mechanical or musculoskeletal in nature accounts for the majority of complaints.[4]

Measurement of sacral base unleveling and LLI can provide a basis for diagnosis and treatment of musculoskeletal or mechanical LBP. Of those authors who support the relationship between LLI and LBP, some choose to measure LLI while others measure sacral base unleveling.[5,6,7] In this study, both were considered. Correlation between the side and direction of sacral base unleveling is not necessarily instructive. Greenman points out that in accordance with Lloyd and Eimerbrink's classification categories, on rare occasion, the sacral base can possess a contralateral tilt and actually have a higher level on the side of the "short leg."[6] Further research conducted by Johnson has revealed that there is very little correlation between the direction of sacral base unleveling and the side of LLI.[8] Regardless, most authors agree that LLI and/or sacral base unleveling can be measured by radiography and the results of the radiography measurements are reproducible.[4-7,9-16]

Radiographs used to measure LLI or sacral base unleveling are →

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

[b]This study was cleared through the Force Medical Officer and Biomedical Research Director, Navy Special Warfare Command.

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AP radiographs of the pelvis performed on a standing patient. In order to minimize error, an accurate true vertical or horizontal reference line must be established. The subject, in bare feet, must stand with heels underneath the ipsilateral acetabula and the patient's buttocks must be in contact with the cassette. The x-ray tube must be at femoral head height.[4,5,10,13,16]

In measuring LLI, a horizontal line is drawn over each femoral head apex, and a resultant LLI is determined against the vertical difference of these horizontal measurements. In determining sacral base unleveling, vertical lines are drawn through each femoral head apex. A line is then drawn over the sacral "line of eburnation" or line of increased bone density.[5] This line runs parallel to the sacral base. This line eventually intersects both vertical femoral head lines already drawn. The vertical difference between each intersected line is the measure of sacral base unleveling. However, a study by Fann et al found that:

> the percent agreements for both intrarater and interrater measurements were significantly higher for the intersulcate line than for the line of eburnation. If the line of eburnation method is used in a controlled study to correct leg length discrepancies to relieve chronic back pain, the hypothesis results (that correcting such a discrepancy will decrease the amount of pain) may not be achieved, not because the treatment is ineffective but because the wrong size lift was applied to the wrong side. [Therefore, they] recommend using the intersulcate line when assessing a patient for pelvic obliquity.[17]

Most authors question the accuracy and reproducibility of anthropometric measurements, either by palpation or tape measure. Friberg cites studies in which examiner error reaches +/-10 mm (2/5").[14] Giles and Taylor cite a study in which 5% of the examinations yielded a 10 mm (2/5") error.[4] Beal and Gofton state that an LLI tape measurement of 12.5 mm (1/2") or less is unreliable.[9,15]

Although Gofton agrees with the accuracy and reproducibility of radiographic measurements, he believes a clinical method (without tape measure) can detect LLI of 9 mm (1/3") and greater, and that this method is "sensitive and sufficient for ordinary use."[9] This method involves viewing the standing patient from behind and noting gross iliac crest asymmetry, and using calibrated blocks under the shorter leg to view iliac crest leveling.[9] Cailliet believed his examination method of the pelvic level was accurate to 6.5 mm (1/4").[18]

Travell notes the supine method is one of the least reliable measurement methods. This is because Travell notes a supine LLI found in leg lengthening and leg-shortening maneuvers has the potential of functional shortening of a leg as a result of a quadratus lumborum trigger point.[19] The authors believe their method of examination negates to an acceptable level, these factitious leg lengthening/shortening inaccuracies.

The authors believe that a thorough musculoskeletal exam can detect significant LLI. In this study, the presence of sacral base unleveling and not the specific LLI measurement was of primary concern. Unlike the standing examination of most clinicians, the authors' method for detecting significant LLI involves comparing four points: the medial malleoli, ASIS of the supine subject, inferior lateral angles (ILA), and the left and right sacral sulci. Prior to the comparison, the subject is instructed to empty all pockets since objects will affect the measurement. The patient then must lift his or her buttocks off of the table for a brief moment. This prevents the unequal setting of femoral heads in their respective acetabula and bilaterally affects attached musculature. Unequal setting of femoral heads can be factitiously produced and this can be easily demonstrated on the supine subject. The medial malleoli will appear longer after one leg is either internally or externally rotated at the hip. The authors believe that a careful physical examination can detect a LLI to an error of 1/8". Postural AP pelvic radiographs were not taken nor were they recommended.

Lift treatment usually involves inserting a durable lift in the corresponding shoe of the "short leg." Authors supporting lift treatment vary considerably in their initial prescribed lift thickness and whether periodic lift increases are indicated. Table 1 outlines the various lift treatments that various authors used in their respective studies.

Table 1

Author	Initial Lift	Increases in Lift
Friberg[14]	a few mm < LLI	not mentioned
Giles/Taylor[4]	equal to LLI*	not mentioned
Gofton[9]	9-10 mm (3/8")	not mentioned
Greenman[6]	to level sacrum**	not mentioned
Hoffman[7]	3 mm (1/8")***	2 mm (1/12")q 10-14 days
Irvin[5]	3 mm (1/8")****	1.6 mm (1/16") q 2 weeks
Patriquin[28]	1/8" to 1/2"	not mentioned

* If >5 mm, raise sole an equal amount over 5 mm.
** If > 8 mm, 50% placed on heel of short leg, 50% taken off heel of long leg.
*** If > 20 mm, sole must be adjusted an equal amount over 20 mm. Amount to be added periodically until sacral leveling occurs.
**** If > 8 mm, raise sole an equal amount over 8 mm. Add 1.6 mm every two weeks until sacral leveling occurs.

From the small sample of treatments analyzed, those authors who treat LLI, as opposed to the sacral base, do not use gradual lift increases. Although not specifically indicated in their work, lifts are assumed to be permanent if the treatment results in a corrected LLI and an overall reduction in pain. The same is assumed for those authors who treat the sacral base. As long as the sacrum is level, and an overall reduction in pain occurs, the lift will remain. Of the authors studied, only Beal notes a LLI may be functional in nature and warrant temporary lift placement. He indicates that functional LLI, as opposed to structural LLI, may be caused by unilateral psoasitis, unequal lumbar tension, shortening of the fascia about the hip, shortening or relaxation of the ligaments, or flat feet.[15]

Some authors have treated their patients with spinal manipulation in addition to lift treatment. These studies were conducted by osteopathic physicians and chiropractors. Proponents of osteopathic manipulative medicine have supported the association of LLI, sacral base unleveling, and potential LBP.[9] Osteopathic literature emphasizes "the need for appropriate manipulative treatment to assist the patient in the process of accommodation to the lift."[15]

The authors feel that lift treatment is indicated for sacral base unleveling secondary to muscle imbalance via the following mechanism. An unlevel sacral base decreases the ability of the spinal column to balance the forces of gravity, which can be associated with gait dysfunction. Gait dysfunction can create a muscle imbalance over time or result from a muscle imbalance, which in turn can accentuate or create a LLI. Shell and Irvin report that, "Other than ideal configuration of the feet and attitude of the sacrum necessarily destabilizes the musculoskeletal system to a subtle but unrelenting extent."[20]

In addition, prior surgery or lower extremity trauma may also cause a LLI via viscerosomatic or somatosomatic reflexes, respectively. The authors acknowledged that a LLI does not necessarily cause LBP. The author's primary concern in providing lift treatment was to level the sacral base.

At least since the late 1800s, several dozen physicians have been engaged in a debate through the literature regarding the significance of leg length inequality (LLI) and the relationship to LBP.

The definition of significant LLI differs depending on the author. Table 2 illustrates the different definitions of significance with regard to LLI according to authors who support the association between LLI and LBP.

Table 2

Author	Significant LLI (> or =)
Friberg[14]	5.0 mm (1/5")
Travell[19]	6.0 mm
Gofton[9]	9.0 mm
Giles/Taylor[4]	10.0 mm (2/5")

On the other side of the debate, some authors are skeptical about the relationship between LLI and LBP. The results from the study by Soukka et al concluded that the association between mild and LLI and LBP is questionable; LLI of up to 20 mm (4/5") were considered.[11] Papaioannou et al studied 23 young adults seeking treatment for a LLI that existed since childhood. The discrepancies ranged from 12 mm to 52 mm, and not one subject had any LBP.[21] Grundy and Roberts used a ''locating jig" to assess LLI in 70 subjects. They concluded that chronic LBP is unlikely to be a part of a shortened lower limb.[12] Their study, however, did not rule out that LBP may be a function of an unleveled pelvis and not necessarily LLI.[9]

Friberg and Gofton clearly state that LLI will not likely contribute to chronic LBP if the individual is not standing and/or walking a considerable amount. LBP from a LLI is usually relieved by sitting or reclining.[9,10,13] Friberg, however, specifically notes that a military population would be susceptible to LBP from a LLI.[13]

Measurable LLI is extremely prevalent in our population. What causes this LLI? Giles and Taylor point out that the vast majority of patients with a LLI of 10 mm or more have no known etiology.[4] Friberg's study found that 92% of his LLI subjects bore an unknown etiology.[14] Known etiologies of LLI include epiphysial growth dysfunction (infection, trauma, tumor, etc.), fractures, poliomyelitis, congenital ball and socket ankle joint configuration, joint surgery, foot pronation and juvenile rheumatoid arthritis.[10]

Some proponents of lift treatment suggest a direct relationship between LLI and LBP, and propose that LLI and pelvic tilt are related. A pelvic tilt can be associated with a sacral tilt. Gofton points out that a 12.5 mm (1/2") LLI can result in a sacral inclination of 4 degrees. A superimposed weight of 45 kg (100 lbs.), likely in a normal sized man, would result in a lateral force of 2.2 kg (5 lbs.). This force must be met by various muscles and ligaments, which can likely produce pain.[9] This sacral tilt may also result in compensatory movement of the spinal column. Any or all of the above asymmetries may ultimately result in a muscle imbalance of the lower back.

Naval Special Warfare comprises the special operations forces of the U.S. Navy. NSW sailors serve in SEAL (Sea-Air-Land) Teams, SEAL Delivery Vehicle (SDV) Teams, Special Boat Units (SBU), or the respective staffs of these units, which also includes support personnel. The regular operational training for these units is physically demanding and all service members are expected to be in sound physical condition. Standing, patrolling, and running are all regular activities for these personnel. NSW personnel train hard and are no →

strangers to physiologic insults to their musculoskeletal systems.

The authors of this study, therefore, feel that the effects of LLI were often physiologic and therefore reversible in nature and not necessarily anatomic (osseous) and irreversible. The hypothesis of this study was that by the objective leveling of the sacral base by the appropriate use of a heel lift, patients would report a significant subjective reduction of LBP beyond the placebo effect. The authors believe the one third placebo effect noted by Turner et al to widely occur in such studies did not apply to the same degree in this study. The reported reduction in the complaint of subjective LBP was always correlated with the objective examination of finding a level sacral base.[22]

Method

Study subjects included 31 male and 4 female sailors who randomly presented to the medical department of Special Boat Squadron Two (SBR-2) with a chief complaint of LBP from July 1, 1997 to March 9, 1999. Two patients (5.7%) dropped out of the study secondary to intolerance to the lift and had no relief. All sailors in the study were comprised of both officer and enlisted personnel that were attached to a NSW command, 9 of which were SEALs. Their ages ranged from 26 to 53 years old (mean age 35.9 years) with a history of LBP for 0 to 168 months (mean history 46.6 months). All of the patients had used traditional treatments of medications, physical therapy and heat/cold without relief prior to presenting to SBR 2 Medical. Nine patients had undergone extensive work-ups with no cause identified for their LBP prior to presenting at SBR 2 Medical. All subjects had consented to the anonymous presentation of their clinical outcomes.

Following diagnosis of sacral base unleveling, thirty-five patients were treated with a heel lift inserted into the shoe of the short leg side. All medical department appointments were documented in their medical records and these notes contained the patients' subjective pain evaluations. Patients had their outcomes recorded in their medical record. Patients provided their current subjective symptoms during an exam or recorded through a telephone interview.

Pain was measured using a subjective pain scale. The patients were asked how they would rate their pain on a scale of 0 to 100, if 0 were no pain and a score of 100 would be sufficient to make them "pass out". The patients were asked to provide a score for their worst pain, a pain with the use of prescribed medications, and their current pain on a "day-to-day" basis.

After eliciting a thorough history, one physician performed all of the physical examinations which included an in-depth musculoskeletal examination. Sacral base unleveling and LLI were assessed by comparing the medial malleoli and ASIS of the supine subject, and the ILA and sacral sulcus depths of the prone subject as described previously. In order to ensure that the differential diagnosis of LBP was thoroughly addressed, laboratory studies consisting of CBC, ESR, CHEM 18 and lumbosacral radiographs were ordered and cleared appropriately.

Patients found to have a LLI were given a 3/8" lift to be placed into the shoe of the physiologic short leg. Sometimes shortness was not readily apparent due to ASIS inequality making limbs appear equal at the medial malleoli. Hips were then rotated using an osteopathic muscle energy technique used to level the ASIS bilaterally; and thus revealing the short leg side.[23] All personnel agreeing to lift treatment were provided with anticipatory guidance about minor aches and pains that might occur in the body (mainly feet, knees, and hips) as the body adjusted to the placement of the heel lift. Patients were then followed by the physician and Independent Duty Corpsman (IDC) at one month intervals to evaluate the effectiveness of treatment. All patients in the authors' study received osteopathic manipulative treatment as an adjunct to lift treatment. Manipulative treatment was considered to facilitate overall recovery; and although this may have introduced variables, osteopathic manual manipulation was used after the first month of treatment because the patients' prompt recovery was considered an ethical priority. The follow-up visits might necessitate fine tuning in accordance with Figure 1. Follow-up lumbosacral radiographs

Figure l

LIFT DECISION TREE

1. Evaluate sacral base and LLI findings in the same manner as the original visit.	Go to: step 2
2. Is the patient experiencing pain?	
YES	Go to: step 3 or 4
NO	Go to: step 5 or 6
3. Pain with Sacral Base not level and LLI still exists	Go to: step 8
LLI opposite original diagnosis	Go to: step 7
4. Pain with Sacral Base level and LLI no longer exists.	Go to: step 10
5. No pain with Sacral Base Level and LLI still exists.	Go to: step 9
6. No pain with Sacral Base Unlevel and LLI still exists.	Go to: step 7
7. Decrease lift height by l/8".	
8. Increase lift height by l/8".	
9. Continue using the lift at the current height.	
10. Discontinue the use of the lift.	

were not obtained since careful physical examination assessed sacral base response. Subjecting the patient to further radiation for the purpose of demonstrating radiographically the sacral response to lift treatment was deemed unnecessary. This is based on the ample proof in the literature regarding this phenomenon; and, the easily palpable sacral landmarks.[24]

Results/Data Analysis

All statistical analysis were carried out with Real Stat (Version 1.81, Kiser Software Company). Outcome measures were analyzed by Z test contrasting history of the pain, worst pain level, pain level with medication, daily pain level, pain level with lift use, and days to LBP resolution. For the purpose of time to recovery, the 2 patients who dropped out of the study were omitted from analysis. The p values reported are conservatively expressed as two tailed and values where p is less than 0.05 were considered statistically significant. Comparisons between maximum pain and medicated pain levels and maximum pain and post-lift use pain level were evaluated to compare treatments.

Of the thirty-five patients who participated in this study, 28 (80.0 %) had complete resolution of their LBP within 3 to 30 days (mean 16.6 days) of starting lift treatment. Their average daily pain went from 38.2 to 0. Of the 7 patients who failed to have complete relief, 4 (11.4 %) had an overall reduction in their daily LBP. Their pain level decreased from an average level of 50 to 20, an overall reduction of 60%. One of the these three individuals had his pelvis crushed in a motor vehicle accident. His pelvis was reconstructed with large amounts of metal hardware which has subsequently been deformed in a parachuting accident prior to his entry into the study. He entered the study with hopes of a non-invasive relief of his LBP. One patient (2.9%) had no reduction in his daily pain level of 10. However, he has not experienced an exacerbation of his LBP in 6 months where they had been occurring at a rate of at least 1 episode per month for 8 years.

Discussion

Some authors and many practitioners are doubtful of the relationship between LLI and LBP.[11,12,21] Frymoyer stated that LBP patients tended to get better in 6 weeks.[25] This guideline has proven to be of little use in our study population. Subsequent findings by Von Korff and Saunders confirm the inadequacy of this line of reasoning.[26] While many of the researchers who endorse the LLI-LBP relationship have studied the results of lift treatment, some authors who are skeptical of the relationship have not clinically evaluated the results of lift treatment. The results of numerous studies, as indicated in Table 3, demonstrate the clinical benefits of lift treatment.

Although this paper focuses on alleviating LBP, several authors also support the clinical efficacy of lift treatment in other musculoskeletal ailments. Goel noted that treatment with a heel lift relieved a patient suffering with meralgia paresthetica.[27] Friberg documents lift treatment rid sciatica in 61 of 83 patients (73.5%) and eliminated chronic hip symptoms (to include pain from hip arthroses) in 56 of 79 patients.[14] Rothenberg, a rheumatologist, supports Friberg's results, and specifies osteoarthritis and bursitis as specific chronic hip conditions that were improved.[10] Gofton, another rheumatologist, asserts there is a likely relationship between LLI and a form of osteoarthritis.[9] These authors also contend that these painful conditions are likely associated with prolonged standing and associated relief upon sitting.

Still very few lift treatment studies exist. Both Patriquin and Beal noted the same lack of objective data.[6,15] In addition, lift treatment studies are not conducive to controlled conditions. Many authors acknowledge the unavoidable variability they were forced to accept. For obvious ethical considerations, no study included an untreated control group of symptomatic patients. In addition, pain is subjective and extremely difficult to measure; and in most studies, the author worked alone. Most larger studies also report losing contact with many patients for long term assessment. Giles and Taylor specifically note that many of their patients were opposed to radiographic reassessments.[4]

Regardless of study, most of the authors acknowledge that lift therapy is simple, inexpensive, non-invasive, and poses negligible risks to the patient. Rothenberg notes that prior to his consultation, some physicians had previously ordered tests of computed tomography (CT) scans and myelograms (EMGs), and treatments →

Table 3

Author	# with LBP	Total relief	Some relief	No relief
Giles/Taylor[4]	50	Significant relief recorded but not in this form+		
Gofton[9]	10	All reported major or complete relief++		
Friberg[14]	128	96 (75%)	20 (15. 6%)	12 (9. 4%)
Patriquin[28]	51	42 (82%) +++	77 (14%)	2 (4%)
Rothenberg[10]	12++	6 (50%)	2 (16.7%)	4 (33.3%)

\+ Lift treatment plus manipulation;
Relief recorded as number of post-treatment LBP complaints and lost work days.
++ Rheumatology referral patients;
Select group of unexplained LBP with extensive prior work-ups.
+++ Only 17 of 42 had complete long term relief, the remainder had intermittent long term relief.

of extensive exercising, pharmacotherapy with NSAIDS, physical therapy and hospitalized pelvic traction.[10] Rothenberg was able to effect long term relief with a simple heel lift.

The authors believe the crucial point to make prior to the placement of a lift is whether or not the sacral base needs leveling. The point of lift treatment is to level the sacral base.

Following the decision tree of Figure 1, lift treatment in 94.3% of NSW personnel participating in the study resulted in a reduction of overall pain, a reduction in severity of remaining pain, and an increase in the ability to perform physical tasks. 5.7% of the participants (2 patients) dropped out due to lift intolerance. Sometimes patients fail to keep the lift all the way back in the heel and some patients take the lift in and out of their shoes. Both of these actions can cause an intolerance to the lift. Accompanying the reduction in pain and the increase in activity was an overall leveling of the sacral base in all of the sailors evaluated. NSW sailors reported an increase in their productivity and an overall increase in their sense of well being.

The authors did note some limitations of this study and they include: the cases under discussion differ from those ordinarily encountered in that all of these personnel are highly motivated, goal oriented personnel who often started out in well above average physical condition. To be fair, many of our patients were compromised by severe training regimens rendering our treatment success that much more impressive. The study was limited by the small number of patients, and the pain level was a subjective measurement which varies from patient to patient. In our experience, NSW personnel tend to underestimate the level of pain they are in. To control for this variable, the exact same questions, as outlined earlier, were given during each interview to all patients. Consistency within patient reports was stressed. There was no wrong answer but patients had to be consistent with their ratings.

Conclusion

The data indicates the majority of LBP patients were successfully treated with lifts. These findings also suggest that the traditional treatments of medication, physical therapy, and heat/cold may not be adequate in the treatment of posturally related LBP since they do not directly correct the underlying somatic dysfunction, namely an unlevel sacral base. However, lift use does correct this somatic dysfunction and is simple, inexpensive, non-invasive, produces relatively rapid results, and is generally well tolerated.

Lift treatment can easily be provided to other patients with similar results. A trained physician or supervised IDC can provide this treatment safely in order to relieve patients of their LBP which may be posturally related. Postural relationship can be determined after a thorough history, physical exam, screening laboratory tests, and lumbosacral radiographs fail to reveal any underlying medical or surgical condition in the differential diagnosis of LBP.

These treatments are in accordance with Department of Defense and Veteran's Administration clinical guidelines for the treatment of LBP developed by a joint panel of over twenty top civilian and military experts in the field of LBP.[2]

Table 4

PAIN DATA

	History	Worst	After Meds	Daily	After lift	Days to Relief
M	46.57	71.26	42.71	38.86	4.86 (2.50)*	16.62*
SD	49.71	20.67	23.88	21.94	12.04 (7.07)*	8.04*

* Includes all patients except for the two patients who dropped out of the study.

References

1. Carey T, Evans A, Hadler N, Kalsbeek W, McLaughlin C, Fryer J: Care-seeking Among Individuals With Chronic Low Back Pain. Spine 20:312-317, 1995.
2. Praemer A, Furner S, Rice DP: Musculoskeletal Conditions in the United States. American Academy of Orthopaedic Surgeons, 1992.
3. Svensson H, Anders V, Wilhelmsson C, Anderson G: Low-Back Pain in Relation to Other Diseases and Cardiovascular Risk Factors. Spine 8:277-285, 1983.
4. Giles L, Taylor JR: Low Back Pain Associated With Leg Length Inequality. Spine 6:510-521, 1981.
5. Irvin RE: Reduction of Lumbar Scoliosis by Use of a Heel Lift to Level Sacral Base. JAOA 91:34, 37-44, 1991.
6. Greenman, PE: Lift Therapy: Use and Abuse. JAOA 79:238-250, 1979.
7. Hoffman KS, Hoffman LL: Effects of Adding Sacral Base Leveling to Osteopathic Manipulative Treatment of Back Pain; A Pilot Study. JAOA 94:217-226, 1994.
8. Johnson K: Comparison of Pelvic Somatic Dysfunction and Apparent Leg Length Discrepancy. JAOA 8:672, 1994.
9. Gofton J: Persistent Low Back Pain and Leg Length Disparity. Journal of Rheumatology 12:747-750, 1985.
10. Rothenberg RJ: Rheumatic Disease Aspects of Leg Length Inequality. Seminars in Arthritis and Rheumatism 17:196-205, 1988.
11. Soukka A, Alaranta H, Tallroth K, Heliovaara M: Leg Length Inequality in People of Working Age: Association Between Mild Inequality and Low-back Pain is Questionable. Spine 16:429-431, 1991.
12. Grundy PF, Roberts CJ: Does Unequal Leg Length Cause Back Pain? A Case-control Study. Lancet 2:256-258, 1984.
13. Friberg O: Letter. Spine 17:458-460, 1992.
14. Friberg O: Clinical Symptoms and Biomechanics of Lumbar Spine and Hip Joint. Spine 8:643-651, 1983.

15. Beal, MC: The Short Leg Problem JAOA 76:745-751, 1977.

16. Friberg O: Functional Radiography of the Lumbar Spine. Annals of Medicine 21:341-346, 1989.

17. Fann AV, Remington L, Verbois GM: The Reliability of Postural X-Rays in Measuring Pelvic Obliquity. Archives of Physical Medicine and Rehabilitation 80:458-461, April 1999.

18. Calliet R: Low Back Pain Syndrome, 2nd ed. Philadelphia, PA Davis Co, 1979.

19. Travell JG, Simons DG: Myofascial Pain and Dysfunction. The Trigger Point Manual. Baltimore, Williams & Wilkins, 1983.

20. Shell M, Reinhard D, Irvin R, Curtin T: Neuromuscular Sequelae of Post-concussion Syndrome and Posttraumatic Headache That Result From Mild Traumatic Brain Injury: A Comprehensive Review. Physical Medicine and Rehabilitation 12(1):85-97, 1998.

21. Papaioannou T, Stokes I, Kenwright J: Scoliosis Associated With Limb-Length Inequality. The Journal of Bone and Joint Surgery 64A:1:59-62, 1982.

22. Turner JA, Deyo RA, Loeser JD, Von Korff M, Fordyce WE: The Importance of Placebo Effects in Pain Treatment and Research. JAMA 271(20):1609-1614, May 25, 1994.

23. DiGiovanna EL: An Osteopathic Approach to Diagnosis and Treatment. New York, Lippincott, 1991.

24. Irvin RE: The Origin and Relief of Common Pain. Journal of Back and Musculoskeletal Rehabilitation 11:89-130, 1998.

25. Frymoyer JW: Predicting Disability From Low Back Pain. Clinical Orthopaedics and Related Research 279:101-109, 1992.

26. Von Korff M, Saunders K: The Course of Back Pain in Primary Care. Spine 21:2833-2839, 1996.

27. Goel A: Meralgia Paresthetica Secondary in Limb Length Discrepancy: Case Report. Archives of Physical Medicine and Rehabilitation 80:348-349, March 1999.

28. Patriquin DA: Lift Therapy: A Study of Results. JAOA 63:840-844, 1964.

29. Lipton JA, Jones W, O'Conner F, Polly D, Sutton E, and Wainner R: VA/DOD Clinical Guidelines for the Management of LBP or Sciatica in the Primary Care Setting. Washington, Birch and Davis Associates Inc., April 1999.❐

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fined by the World Health Organization includes patients' physical, mental and psychosocial capabilities used in performing tasks demanded by their daily activities. An environment that emphasizes specific interest in well being is an important part of any osteopathic health care plan. Physician attention to all components of health should be included in the plan to advance and maintain the osteopathic medicine's and its physicians' images.

The Osteopathic Professional Organizations, AOA, AAO, COMs, Continuing Education Program, State and affiliated organizations, are involved at different levels in managing the delivery of health care. Representation from each level should be used in structuring the plan to advance and maintain osteopathic medicine's image at the forefront of modern health care. The referenced models are adaptable to a health care delivery model by including continuous quality improvement (CQI)[12], publishing practice guidelines and identifying evidence-based decisions used in practice (see reference 9, Chapter 41, 721-726). CQI methodology uses data obtained on health care delivery procedures and measured health care outcomes to establish an ongoing database with periodic reevaluations. Guidelines for practice are essential to ensure that the procedures and measurements represented in the data provide reliable data. (Guidelines minimize individual physician variables that decrease data validity for use, in reimbursement, clinical databases and in meta-analysis of multiple clinical reports.) Evidence-based decisions reduce variability in the health care delivery process and increase reliability of health outcome data.

This series is designed to inform the practicing physician about the need and probable changes that accompany efforts to advance osteopathic medicine's image in the twenty-first century. Administrative levels in the osteopathic profession, involved in updating health care delivery, depend upon networking all management levels in planning and approving a strategic management plan. Published data on osteopathic physicians' effectiveness in providing patients' health care provides support for the entire system. As the plan is formulated, tested for feasibility, and implemented, the practicing physicians' input – in planning health care guidelines and data recording, and evaluating the plan's effectiveness – is an important resource. Guidelines and evidence-based decisions in practice is the key to successfully advancing and maintaining osteopathic medicine at the forefront of health care.

References

1. AOA House of Delegates' Resolution
2. Heath, DM, Kelso AF: A new challenge: Replacing opinion-based with evidence-based decisions. JAAO, Volume 9, Number 4, Winter 1999, pp11.
3. Osteopathic Vision: 1995-96 Yearbook; Edited by Myron C. Beal; 1998; AAO, Indianapolis, IN. See Trowbridge, C.: A.T. Still's Philosophy; Implications for education, practice and research. Pages 126ff
4. Jonas's Health Care Delivery in the United States; 5th Edition; edited by Kovner AR, 1995, Springer Publishing Company, Inc.: New York, Chapters, 11, 12, 13, 15, 16
5. Diagnostic Strategies for Common Medical Problems, 2nd edition, edited by Black ER, Bordley DR, Tape TG, Panzer RJ; 1999; American College of Physicians, Philadelphia, PA
6. Cost effectiveness
7. Occupatinal Musculoskeletal disorders Function, Outcomes and Evidence by Mayer TG, Gatchel RJ, Polatin PB; 1999, Lippincott Williams & Wilkins; Philadelphia, PA
8. Jealous JS; Accepting the death of osteopathy: A new begining; The 1999 Northoup Lecture. JAAO; 9:4; Winter 1999, pp23.
9. Strategic Managment: Formulation, Implementation and Control ; edited by Pearce JA, Robinson RB; 1999 7th edition, 2000, McGraw Hill Companies, Inc; Boston
10. Adizes I: Managing Corporate Life Cycles; 1999; Prentice Hall Press: Paramus: New Jersey
11. Directory of Osteopathic Physicians; 1999; AOA Yearbook; Chicago, Pg. 20
12. Sleszinsky S, Glonek T., Kuchera M; Standarized Medical record – A new outpatient osteopathic SOAP Note: Validation of a standarized office form against a physician's progress notes; 1999; JAAO 88(10);516ff.❐

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Segmental: lower extremities normal motion, sacrum has decreased amplitude of the primary respiratory mechanism especially at the right sacral base, bilateral sacroiliac joint restriction right greater than left with a positive right compression test, and ASIS and PSIS were level. L5 was flexed, sidebent left, and rotated right. Ribs 8,9,10, and 11 were in exhalation on the right, ribs 1-11 had somewhat decreased respiratory excursion on the left, and the diaphragm was in exhalation bilaterally. Thoracics 3-10 had bilateral paravertebral hypertonicity with sagittal plane mechanics forward bent T6-T8. Cervicals 2 and 3 were rotated right and sidebent right. Cranial palpation revealed left sidebending rotation strain pattern with almost no motion on the right side of the cranium and the right mandible and temporal bones were internally rotated.

Initial Assessment:

1. Chronic Cephalgia
2. Frequent Sinusitis
3. Somatic Dysfunction of the Head
4. Somatic Dysfunction of the Cervicals, Thoracics, and Lumbars
5. Somatic Dysfunction of the Ribs and Diaphragm
6. Somatic Dysfunction of the Pelvis and Sacrum

Treatment Plan:

1. The sacroiliac joint dysfunction was treated using direct prone myofascial release (MFR) followed by supine articulatory treatment of both sacroiliac joints to restore full motion in the pelvis.
2. The lumbar somatic dysfunction was corrected using prone soft tissue stretching followed with lateral recumbent direct high velocity low amplitude thrust (HVLA).
3. The diaphragm was treated with direct inhibition using respiratory force, which improved the respiratory excursion of both the diaphragm and the rib cage.
4. The ribs in exhalation were treated using supine indirect MFR with respiratory force.
5. The thoracic somatic dysfunction was treated using soft tissue kneading and stretching followed with seated direct operator springing technique.
6. The cervical somatic dysfunction was corrected using supine indirect MFR.
7. The cranial strain pattern was treated with osteopathy in the cranial field (OCF) using bilateral condylar decompression followed by direct sphenobasilar symphysis (SBS) release. This release is performed by grasping the greater wings of the sphenoid bone and the occipital bone and slowly disengaging the sphenoid bone by lifting anteriorly and inferiorly. The sphenoid bone is slowly returned to position and rechecked for motion.
8. Lastly, the TMJ dysfunction was treated using direct mandible disengagement by grasping both sides of the mandible between my thenar eminences and applying traction inferiorly, anteriorly, and medially until a release is felt. The mandible is then slowly released to its normal position and the mechanism is rechecked.
9. CC was instructed in deep breathing techniques and she was to do ten deep breaths twice a day.
10. She was to return to the office in two weeks.

Course of Treatment:

CC returned in four weeks with only two, less intense, and self-limited headaches of very short duration. She reported no TMJ symptoms and resolution of a "twisting feeling" on the right side of her body (that she had not noticed until its absence). Her pelvis and sacrum had full excursion of motion and the sacroiliac joints had no restrictions. Her mandible and temporal bones were in internal rotation but the SBS strain was resolved. She was treated again using OCF. Her last visit was four weeks later with headache resolution. Her mandibular bone continues to be laterally displaced to the left as compared to the maxilla. Continued cranial treatments will be used to attempt to correct this dysfunction.

Discussion:

Cephalgia is a common complaint that can be successfully treated using osteopathic manipulative treatment. The Osteopath has the advantage of a thorough knowledge of anatomy and physiology and the understanding of the interdependence of these systems. Changes in structure from the legs (sacral base unleveling), to the thoracic and cervical spine, and to the cranium can be the underlying cause of headaches. For example, as in this patient, sacral and sacroiliac joint dysfunctions can affect the cervical spine, occipital bone, and the entire cranial mechanism via dural attachments. In addition, CC had torsional strains induced by her orthodontic appliances. As a result she will continue to need OCF treatments to correct these dysfunctions as they arise through her dental treatment. Furthermore, somatic dysfunction at C 1 and C2 can cause irritation of the vagus nerve causing pain and nausea in the posterior cranial fossa below the tentorium cerebelli. Dysfunction of cranial nerve V can lead to anterior and middle cranial fossa pain, that is pain above the tentorium cerebelli. These dysfunctions are addressed using various techniques to correct the pelvis, sacrum, thoracic, and cervical spine as well as the cranial mechanism.

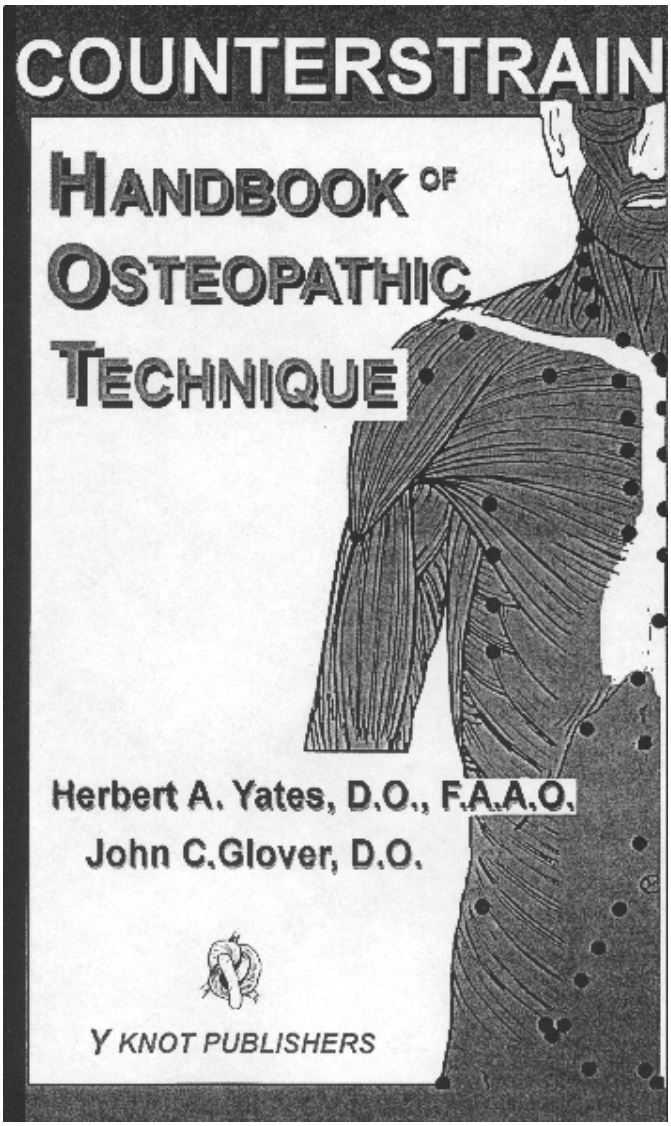
According to Kuchera, proper venous drainage at the jugular foramen is also necessary to prevent venous congestion, which can lead to headaches and anxiety. TMJ dysfunction can affect the jugular foramen via the temporal bone, which affects occipital bone motion. He continues, proper functioning of the venous and lymphatic systems depend on full respiratory function of the thorax and particularly the diaphragm. These dysfunctions were also addressed in CC by correcting the SBS strain and restoring rib and diaphragmatic function. Rational treatment of headaches must include restoration of structural relationships, venous and lymphatic function, and consideration of previous trauma as a cause.

References

Kuchera, Michael, Kuchera, William: Osteopathic Considerations in Systemic Disease. Columbus, Greyden Press, Revised 2nd Ed, 1994.

Magoun, HI: Osteopathy in the Cranial Field. Kirksville, Journal Printing Co., 3rd Ed, 1976.

Ward, Robert, et al, Foundations for Osteopathic Medicine. Baltimore, William and Wilkins, 1997.❒



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