


THE AAO

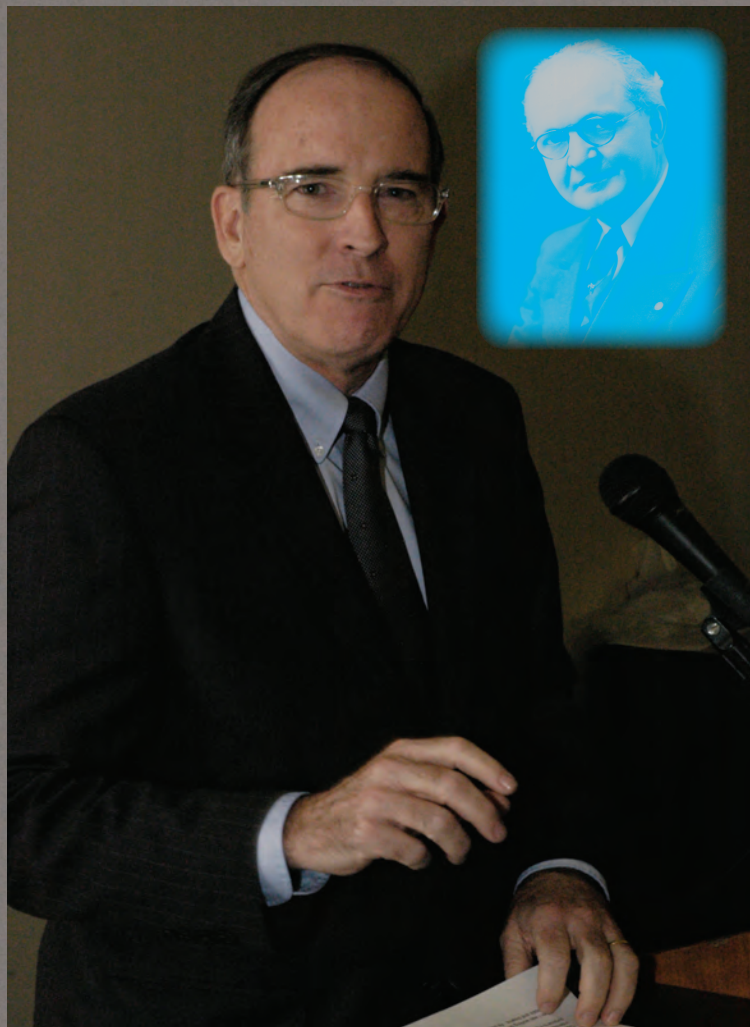
FORUM FOR OSTEOPATHIC THOUGHT

JOURNAL

 Official Publication of the American Academy of Osteopathy®

TRADITION SHAPES THE FUTURE

VOLUME 18 NUMBER 1 MARCH 2008



**Hollis H. King, DO, PhD, FAAO Presents
2007 Northup Memorial Lecturer**

page 21

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.

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 Robert Clark, DO, Editor-in-Chief, 3243 Clayton Road, Concord, CA 94519. Email: editoraaoj@yahoo.com in word format.

Editorial Review

Papers submitted to *The AAO Journal* may be submitted for review by the Editorial Board. Notification of acceptance or rejection is given, usually, 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 and double-space with one-inch margins. Number all pages consecutively.
2. Submit the original plus two copies. Retain one copy for your files.
3. Check that all references, tables and figures are cited in the text and are in numerical order.
4. Include a cover letter that gives the author's full name and address, the telephone number, the institution from which work initiated and, the 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, the manner in which informed consent was obtained from human subjects.
7. Describe the basic study design; define all statistical methods used; list the 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.

FLOPPY, CD-ROM or DVD

We encourage and welcome a floppy, CD-ROM or DVD containing the material submitted in hard copy form. Although

we prefer receiving materials saved in rich text format on a CD-ROM or via Email, materials submitted in paper format are acceptable.

Abstract

Provide a 150-word abstract that summarizes the main points of the paper and its conclusions.

Illustrations

1. Be sure that submitted illustrations are clearly labeled.
2. Photos and illustrations should be submitted as a 5" x 7" glossy black and white print with high contrast. On the back of each photo, clearly indicate the top of the photo. If photos or illustrations are electronically scanned, they must be scanned in 300 or higher dpi and saved in .jpg format.
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 must also 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), the name and location of publisher and the year of publication. Give the 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).



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THE AAO **FORUM FOR OSTEOPATHIC THOUGHT**
JOURNAL

Official Publication of the American Academy of Osteopathy®
TRADITION SHAPES THE FUTURE • VOLUME 18 NUMBER 1 MARCH 2008

A PEER-REVIEWED JOURNAL

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

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(editor's note: Dr. Batchelor was an OMS 3 at TCOM at the time of writing this paper. She is currently an intern at Baylor College of Medicine and earned her DO degree in 2007)

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Contributors

Margaret Sorrel, DO

Autistic Spectrum Disorders

Explore the complex variants, broad range of symptoms and the wide spectrum of treatment for this complex of disorders that are being seen more and more frequently. Etiologic mechanisms are reviewed. Osteopathic Manipulative Treatment is an important part of the multifaceted treatment needed for these patients.

Hollis King, DO, FAAO gave the *Thomas Northup Lecture* at the 2007 American Osteopathic Association Convention. What is the future of the profession? How do we proceed in the future? Dr. King shares his thoughts on these and other questions.

Austin L. Jones, OMS-4 and Michael D. Lockwood, DO, FCA *Osteopathic Manipulative Treatment in Pregnancy and Augmentation of Labor: A Case Report*

A pregnant patient with back pain is evaluated and treated Osteopathically with beneficial outcome. The authors review the cranial technique: Compression of the fourth ventricle, and discuss its applicability in this and similar cases.

Krystal Batchelor, OMS 3 and Russell Gamber, DO
Migraine and OMT

The case of a patient with a long-term history of migraine headaches is presented. Osteopathic Manipulative Treatment gave the patient significant relief. The authors review some of the more recent clinical research on the role of manual medicine in the multi-faceted treatment of patients with Migraine headaches.

Regular Features

DIG ON. Zachary Comeaux, DO, shows the importance of thinking anatomically and osteopathically in complex patient problems. Often the answer may be easier than expected.

BOOK REVIEW. David Essig-Beatty reviews Zachary Comeaux's historical novel: *Fire on the Prairie: The Life And Times Of Andrew Taylor Still, Founder Of Osteopathic Medicine.*

Other reviews include the journal, *Manual Therapy*, and the book, *Biodynamic Craniosacral Therap.*

ELSEWHERE IN PRINT. Is *Fibromyagia* a legitimate medical diagnosis? Have you every heard of *Baumol's disease*? This fascinating disease is economic, not medical, but is very applicable to the clinical world. One patient presents his views of *medical front office management*. Many osteopathic manipulative medicine specialists will find their practices do reflect the importance of good patient relations.

The future is here. *Artificial Intervertebral Discs* are now being tested in patients. *Cervical Flexion-Rotation motion testing* is evaluated for its accuracy. The effects *spinal mobilization* have on the function of related muscles is analyzed in this research.

AAO Hires New CEO

AAO President **Claudia L. McCarty, DO, FAAO** is pleased to announce the hiring of **Harriet O'Connor, CFRE, CAE** as Executive Director. She will join the AAO staff effective May 19, 2008. Mrs. O'Connor will succeed **Stephen J. Noone, CAE**, who will retire this year after 16 years of service as the Academy's CEO.



Mrs. O'Connor was co-owner of NonProfit Team, Inc. (NPT), a firm engaging in research, writing, consulting and outsourcing. Her experiences involved management, membership development and all aspects of fund development, including event planning, grant writing, prospect research, and major gifts. Among the clients of NPT were the Indiana Hospice and Palliative Care Organization, School Social Work Association of America, Indiana League of Women Voters, Association for Corporate Growth, and Association for Corporate Renewal.

After receiving both her bachelor and master's degrees from Butler University in Indianapolis, Mrs. O'Connor taught social studies at Ben Davis High School in Wayne Township. She then took a position as Researcher/Assistant Curator of the famous Children's Museum in Indianapolis, the largest children's museum in the world. She later formed O'Connor Research, which subsequently merged to become The O'Connor Group and eventually NonProfit Team, Inc.

Mrs. O'Connor is a Certified Fund Raising Executive and, in 1999, earned her Certified Association Executive designation from the American Society of Association Executives. She has delivered a number of presentations on the end-of-life care and is the author of several publications on hospice care. She also has been actively involved in community activities, most recently as a board member of the Indiana Cancer Consortium and a founding board member of the Indianapolis Sunrise Rotary.

She is married to Laurence O'Connor and resides on the north side of Indianapolis. The couple has two children, daughter Erin Woodside of Akron, OH, son Colin of Indianapolis, and one granddaughter Emma.



View from the Pyramids

Robert C. Clark

Recently I was talking with a patient who is a professional editor and writer. The discussion turned to the growing use of abbreviations and acronyms. It is obvious that some have become so widely used that they can arguably be considered part of our language. We both observed that supposedly well-known abbreviations and acronyms in the United States are considered meaningless in other parts of the world, whether English speaking or not. Some acronyms, such as MD and DO, are more widely recognized in the United States.

The scientific community and by extension, the medical professions, started the trend of using abbreviations and acronyms in professional literature. Many professional editors and writers consider the practice slovenly, lazy and pseudo intellectualism. Despite our distaste for the practice, it is here to stay.

There are rules for using abbreviations and acronyms. As editor of *The AAO Journal*, I will follow those rules because *The AAO Journal* is an international journal and various readers may not know the meaning of local abbreviations and acronyms. Authors can make editing easier by following these rules:

1. No abbreviation is ever used without first defining it. That is writing out the term that will be abbreviated then follow it with the abbreviation in parentheses.
2. The proper format is: *Osteopathic Manipulative Treatment (OMT)*. This is the only acceptable form of introducing an abbreviation or acronym in the body of an article. (The italics are used here only for graphic emphasis.)
3. The abbreviation or acronym must be used at least three (3) times AFTER it is introduced. If not, it must be written out each time.
4. Never abbreviate a single word term. The purpose is to contract multiple word terms.
5. Never introduce an abbreviation that is never used in the rest of the article!
6. If there already is a commonly used abbreviation or acronym for the term, use it; do NOT invent a new one.

Never forget the purpose of writing an article is to inform the reader. Make the article easy to read and easy to understand. Doing this insures the reader will learn and consider the author knowledgeable and the article well written.

A discussion with the publications committee regarding the use of abbreviations and acronyms leads us to the following experiment. In the next issue, we are going to try using several abbreviations or acronyms without definition in the

articles, but they will be defined in a glossary in each issue. I invite readers' thoughts on this idea. The first five terms to be tried are the ones that are frequently used in this journal.

Lastly, notice I used no abbreviations or acronyms in this text except for the sample given! "Not so," you say! To prove my point, look on the cover, the name of this journal is **The AAO Journal**. It technically contains an abbreviation. But it is the journal's name and by definition becomes a proper noun. It is editorially no longer an abbreviation or acronym! Grammar and journalism can be so much fun!

The AAO Journal

Commonly used abbreviations and acronyms

American Osteopathic Association (AOA)
American Academy of Osteopathy (AAO)
Osteopathic Manipulative Medicine (OMM)
Osteopathic Manipulative Treatment (OMT)
Osteopathic Principles and Practices (OPP)

NeuroMusculoskeletal Medicine and Osteopathic Manipulative Medicine Plus One Residency Positions at LECOM

Lake Erie College of Osteopathic Medicine has openings in its NMM/OMM plus one residency program for matriculation in July 2007 and December of 2007. Application is open to osteopathic physicians who will have completed a residency in another specialty who wish to become board certified in neuromusculoskeletal medicine and osteopathic manipulative medicine. The one year residency includes self directed and supervised study in inpatient and outpatient manipulative medicine; as well as experience in the training of medical students, interns, residents and other physicians in the skill of osteopathic manipulation.

Candidates will participate in ground-breaking osteopathic research as part of the program. Please respond with a letter of inquiry and CV to: NMM/OMM Fellowship c/o LECOMT 1858 West Grandview Boulevard, Erie, Pennsylvania 16509.

Questions and informal inquiries should be directed to the residency director – John E. Balmer, D.O. at JohnBalmer@aol.com or 814-654-7334 ext 310.



LECOM
COLLEGE OF OSTEOPATHIC MEDICINE
AND SCHOOL OF PHARMACY
ERIE, PENNSYLVANIA BRADENTON, FLORIDA

Dig On



“Even though you’re choking on it, it’s all in your mind” – an osteopathic perspective on Globus Hystericus

Zachary J. Comeaux

Background

Consider the osteopathic relevance of the following:

Case 1: A 33-year-old female presents in the family medicine clinic with right anterior neck pain. Her previous physicians and ear, nose and throat consultants have checked her thyroid, done an endoscopic exam and the appropriate lab tests. All of the results were normal. Steroids temporarily improved her symptoms. She had an auto accident three years previously while pregnant. The focus of care at that time was continuing the pregnancy.

Case 2: A 54-year-old female is referred for an osteopathic manipulative medicine consultation due to neck pain after being admitted for dyspnea. This is the 200th admission in two years for an exacerbation of asthma. Curiously, arterial blood gases are near normal. She is admitted, each time, for shortness of breath, with a panic response. No physician has risked the liability of releasing her without oxygen, aerosol treatments and observation.

Globus

A search of the literature for the diagnosis globus hystericus finds reference to irritation due to high acid reflux or deglutition problems; otherwise the condition is classified as somatoform, or psychogenic.^{1,2,3} The agitation and panic that are present in the patient is easily labeled as causative rather than the comorbidity or reasonable response. Electromyography studies are normal.⁴

Interrelationship of structure and function

A structural examination of these patients reveals a pattern of tenderness, tension and ropiness in the body and insertions of some of the gross musculature of the shoulder and neck, including splenius cervicis and capitus, sternocleidomastoid, levator scapulae and trapezius. What could be the functional association of this with the patient’s symptoms?

Because of the postural resistance to gravity, the core and posterior aspects of the body are organized around the spine and the paraspinal musculature. The anterior aspect of the body, however, relies on a more delicate, often membranous, arrangement of balanced tensions for its integrity and function and is very sensitive.

The hyoid bone is the key to the balance of tension in the superficial layer of the anterior neck. Derived embryologically from the third pharyngeal arch, it is suspended as a trapeze and serves as the equilibrator of tensions between an array of muscles including the sternohyoid, thyrohyoid and omohyoid from below and the hypoglossal and mylohyoid from above. Tension in any part of this system creates imbalance throughout and a sense of tension centrally, hence the sense of choking.⁵

Results of Treatment

Case 1: The description of the anatomic relationships involved, immediately gave the patient relief and an understanding of her strange symptoms, knowing she was not crazy. Knowledge of the anatomy also allowed both the patient and physician a confident beginning place to relieving the symptoms.

Treatment included articulation of the first rib, myofascial release and muscle energy for the levator scapulae, deep tissue work on the trapezius and omohyoid, and stretching of the anterior scalenes and balancing tension on the hyoid bone. The patient reported 50 percent improvement after the first treatment. Insight into the relevant anatomy, significantly allayed her fears of a rare and dangerous pathology. Home exercises were suggested which replicated and reinforced strategies used in the office. These increased her sense of control rather than helplessness.

Case 2: The observation that there could be a musculoskeletal rather than a bronchospastic cause for the patient’s recurrent symptoms prompted the deglutition specialist in the hospital to run electromyograms and discover a pattern of general pharyngeal muscle dysfunction amenable to a variety of therapies. This led to a shift in the definition of the patient’s primary diagnosis of asthma and defined further therapy.

Discussion

There is not a simple plan of manipulation for hyoid associated muscle tension; other than to fix what you find. Cervical and peri-scapular dysfunctions are common and tend to be chronic, long-standing problems. They are pre-symptomatic until they transfer their tension to the more delicate mechanism of the hyoid system.

The Twig Unbent: An Osteopathic Approach to Common Orthopedic Problems in Children May 16-18, 2008

University of New England College
of Osteopathic Medicine
Biddeford, ME

Course Description: Level 3

This course presents osteopathic manipulative approach to common orthopedic problems in children. Topics are presented with a discussion of the pathophysiology using the structure function models, age-associated particulars of biomechanics, and osteopathic manipulative considerations. This course is a good clinical introduction to balanced ligamentous techniques.

Course Objectives:

Participants will enhance their understanding of common musculoskeletal problems in children within the context of osteopathic medicine. Participants will be able to use osteopathic manipulative techniques in their pediatric patients.

Prerequisites:

Basic understanding of functional anatomy. A source to review your anatomy is <www.anatomy.tv/default.aspx> and One Level I course or equivalent.

CME:

The program anticipates being approved for 20 hours of AOA Category 1-A CME credit pending approval by the AOA CCME.

Program Time Table:

Friday, May 16 8:00 am - 5:30 pm
Saturday, May 17 8:00 am - 5:30 pm
Sunday, May 18 8:00 am - 12:30 pm
(Friday & Saturday include two 15-minute breaks and a one-hour lunch; Sunday includes a 30-minute break)

REGISTRATION RATES

	ON OR BEFORE 4/16/08	AFTER 4/16/08
AAO Member	\$550	\$650
Intern/Resident/Student	\$450	\$550
AAO Non-Member	\$775	\$875

(Membership application available on AAO website)

Register on line

www.academyofosteopathy.org

AAO accepts VISA MC Discover Check

Mobilization of the scapula, deep soft tissue treatment to the superior shoulder, and reaching for the omohyoid musculature, seems to work in most patients. Tension in the sternocleidomastoid and the posterior belly of the digastric can be relieved with myofascial release and counter strain.

Summary

The hyoid, a bone without articulations, is unique and is often forgotten. In humans, it serves to create space for the esophagus and airway and depends on subtle regional forces.

These cases and others direct us to reapply our knowledge of anatomy and principles of osteopathic intervention in creative ways, not otherwise defined in treatment manuals or texts. Even though our anatomy training occurs very early in our clinical education, we remain grateful to Dr. Still and our anatomy faculty, for reiterating the importance of structural relationships in patient care.

References

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2. http://www.nexiumresearch.com/globus_hystericus.html
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4. Vaiman M, Shoval G, Gavriel H. The electro diagnostic examination of psychogenic swallowing disorders. *Eur Arch Otorhinolaryngol.* 2007 Nov 6
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2008 AAO Course Calendar

March 26

Fluid Techniques for Interosseous and Embryological Articulations of the Thoracic: Specific Evaluation and Treatment

Bruno Chikly, MD

InterContinental Hotel, Dallas, TX

CME: 4 Category 1A (anticipated)

March 26-30

AAO Convocation: Unlocking the Secrets of the Thoracic Cage

John G. Hohner, DO, FAAO,

Program Chair

InterContinental Hotel, Dallas, TX

CME: 27+ Category 1A (anticipated)

March 30 - April 1

Osteopathic Approaches

in Pulmonology: the Lungs and Airways

Kenneth J. Lossing, DO

InterContinental Hotel, Dallas, TX

CME: 20 Category 1A (anticipated)

May 16-18

The Twig Unbent:

An Osteopathic Approach to Common Orthopedic Problems in Children

Jane E. Carreiro, DO, Program Chair

UNECOM, Biddeford, ME

CME: 20 Category 1A (anticipated)

June 6-8

Beyond Facilitated Positional Release

COMP, Pomona, CA

Stan Schiowitz, DO, FAAO,

Program Chair

CME: 20 Category 1A (anticipated)

July 11-13

Masters Course:

Comparing FPR, Counterstrain and Still Technique

Ann L. Habenicht, DO, FAAO and

John G. Hohner, DO, FAAO, Co-Chairs

CCOM, Downers Grove, IL

CME: 24 Category 1A (anticipated)

October 25

Avoiding Disaster – Osteopathic Approach to the Flu Pandemic

Dennis J. Dowling, DO, FAAO,

Program Chair

Las Vegas, NV

CME: 8 Category 1A (anticipated)

November 7-9

Masters Course: Muscle Energy with

Philip E. Greenman, DO, FAAO,

Edward G. Stiles, DO, FAAO

Stephanie Waecker, DO, Program Chair

AZCOM, Glendale, AZ

CME: 24 Category 1A (anticipated)

December 5-7

An Osteopathic Approach to

Treat Cranial Nerve Dysfunction: ala Barral

Kenneth J. Lossing, DO,

Program Chair

COMP, Pomona, CA

CME: 24 Category 1A (anticipated)

For information regarding these courses:

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3500 DePauw Blvd., Suite 1080

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Kelli Bowersox, Course Coordinator

kbowersox@academyofosteopathy.org

New York City

NMM/OMM Practice for Sale with medical condominium and website

Location: New York City. Available to help with transition. Please contact exclusively 917/331-4594 for further information.

Ann Arbor, MI

Outstanding OMT practice for sale. **Must Sell Immediately.** Earn over 125k at 20 patient hours per wk! Great opportunity for FP or PM&R looking for private practice or moonlighting. Contact: 734/645-7246.

Healer's Touch

A Physician's Journey into the Medical, Miracle, and Mystical aspects of Healing

by Jan T. Hendryx, DO

If you are curious about where our medical system is headed, this highly engaging book is for you. Jan Hendryx tells his intriguing personal story of how he became passionate about a gentle, natural, and powerful approach to self-healing that uses drugs when they are appropriate. Since its founding over a 130 years ago, Osteopathy has had a tradition of using the diagnostic and healing ingredient most wanted in modern medicine – sensitive human touch. I challenge you to put this fascinating book down after you have read the first sentence.”

James L. Oschman, PhD, Author,
Energy Medicine: The Scientific Basis

Learn about what the author describes as the best-kept secret in medicine today, Osteopathy. Enjoy the healing journey that unfolds within these pages.

R. Paul Lee, DO, FAAO

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The BioBasics Program Presents

Exploring Trauma Through an Osteopathic Understanding of Fulcrums

June 13-16, 2008

(Indian Head Resort, Lincoln, New Hampshire)

Keelyn Wu D.O., Course Director; James Jealous D.O., Director of Table Training along with the BioBasics faculty

Trauma, of one type or another, is a common presentation in any practitioner's office. In this course, we will explore the diagnostics and treatment of trauma. The program will be held in a beautiful setting overlooking the Pemigewasset River in Lincoln, New Hampshire, nestled in the White Mountain National Forest. Time to rest, reflect and celebrate life is built into this program.

CME: The University of New England is accredited by the American Osteopathic Association to provide continuing medical education credits for physicians. This course has been designated for 19.50 Category 1A credits.

**To register for this course or for more information please visit our website at www.jamesjealous.com. You may also contact Marnee Jealous Long at (813) 649-0708 or mjlong@tampabay.rr.com for more information.

Day 1 (June 13th)		12:30am - 1:30pm	The Question of Anatomy as It Relates to Trauma and the Whole Patient – Lecture Judy Aldrich, D.O.
12:00pm - 1:00pm	Registration		
1:00pm - 1:15pm	Welcome and Overview Keelyn Wu, D.O.		Day 3 (June 15th)
1:15pm - 1:45pm	Fulcra and the Pattern of Trauma - Introductory lecture Craig Goldberg, D.O.	9:00am - 11:00am	Local to Systemic Neutrals – Lecture & Lab Jim Gaydos, D.O.
1:45pm - 3:45pm	“From Here to There” (The Pattern in the Whole) – Lecture and Lab Karen Gajda, D.O.	11:00am - 12:00pm	Exploring Fulcrums as a Diagnostic and Therapeutic Tool – Lecture Donald Hankinson, D.O.
3:45pm - 4:00pm	Discussion in Small Groups	12:00pm - 2:00pm	Lunch
4:00pm - 5:30pm	Differentiating between Primary and Compensatory Lesions – Lecture and Lab Tom Gilson, D.O.	2:00pm - 4:00pm	Neutral and Wholeness Jeff Greenfield, D.O.
5:30pm - 7:00pm	Treating Trauma Using Barrier vs. Non-barrier Approach during Treatment – Lecture and Lab Steve Kisiel, D.O.	4:00pm - 4:15pm	Discussion in Small Groups
		4:15pm - 5:15pm	Panel Discussion – Growth and Development of the Osteopath Judy Aldrich, D.O., Francois Desrosiers, D.O., Jeff Greenfield D.O., Karen Gajda, D.O., Andrew Haltof, D.O.
		5:15pm - 7:15pm	Stories and Live Music David Hoke, D.V.M.
Day 2 (June 14th)		7:30pm	Dinner, More Live Music and Fun!
9:00am - 9:15am	Movement of Breath and Involuntary Motion – Lecture Andrew Haltof, D.O.		Day 4 (June 16th)
9:15am - 10:15am	Functional Tactics in Unlocking Trauma–Lab Kevin Zorski, D.O.	9:00am - 12:00pm	Relating to Trauma and Wholeness – Lecture and Lab Craig Goldberg, D.O.
10:15am - 11:15am	Primary Respiration and the Power to Heal – Lab Kevin Zorski, D.O.	12:00pm - 1:00pm	Panel Discussion for Questions
11:15am - 11:30am	Discussion in Small Groups	1:00pm - end	Faculty treats Participants
11:30am - 12:30pm	Lab – Update of Skills James Jealous, D.O.		

2008 Component Societies' CME Calendar and other Osteopathic Affiliated Organizations

March 31-April 1, 2008

An international, interdisciplinary research symposium, "Delineating the Evidence Base for Somato-Visceral Interactions and Autonomic Mechanisms of Manual Therapy"
The Osteopathic Research Center
UNTHSC/TCOM, Fort Worth, TX
CME: 16 hours 1A (anticipated)
Contact: Cathy Kearns
817/735-0515
www.hsc.unt.edu:81/eventinfo_1694.html

April 11-14, 2008

Biodynamics of Osteopathy: Phase II
Donald Hankinson, DO
UNECOM, Biddeford, ME
CME: Up to 21 Category 1A
Contact: UNECOM CME office
207/602-2589
www.une.edu/com/cme/events.asp

April 18-20, 2008

*53rd Annual Conference
OMT for the 21st Century*
Florida Academy of Osteopathy
NSUCOM, Ft. Lauderdale, FL
Contact: Ken Webster
717/581-9069

April 30-May 3, 2008

*Centennial Annual Clinical Assembly
and Scientific Seminar*
POMA
Valley Forge Conv Center
King of Prussia, PA
CME: 35 Category 1A; 6 Category 1B
Contact: POMA
717/939-9318
www.poma.org

May 1-4, 2008

111th Annual Convention
Indiana Osteopathic Association
Sheraton Hotel & Suites
Indianapolis, IN
CME: 30 Category 1A
Contact: IOA
(800) 942-0501
317/926-3009
www.inosteo.org

May 1-4, 2008

Spring CME Conference
Virginia Osteopathic Medical Assoc.
The Great Wolf Lodge
Williamsburg, VA
CME: 24 Category 1-A
Contact: Eleina H. Espigh, MBA
804/334-4655
www.voma-net.org

May 2-4, 2008

Manual Medicine: An Osteopathic Approach (Pelvis)
UNECOM, Biddeford, ME
CME: Up to 20 Category 1A
Contact: UNECOM CME office
207/602-2589
www.une.edu/com/cme/events.asp

May 9-11, 2008

*Crash Recovery, The Long Road Home.
Treating Victims of Motor Vehicles
Accidents and Brain Injury*
Director: Maud H. Nerman, DO
Carte Madera, CA
CME: 17 Category 1A (anticipated)
Contact: The Cranial Academy
317/594-0411
www.cranialacademy.org

May 15-19, 2008

*Osteopathy in the Cranial Field
(40-hour basic course)*
Sutherland Cranial Teaching Foundation
Director: Dan Moore
Downers Grove, IL
CME: 40 Category 1A
Contact: Judy Staser, Exec. Secy.
Phone: 817/926-7705
www.sctf.com

May 16-18, 2008

Functional Methods Course: Part 1
Director: Harry Friedman, DO, FAAO
Los Gatos, CA
Contact: Harry Friedman, DO, FAAO
www.sfimms.com to register

May 28 – June 1, 2008

*2nd International Congress of
Osteopathic Medicine Ages in Motion:
Pediatrics and Geriatrics*
Kongresszentrum Kalsruhe, Germany
All information about the conference is
available at <http://www.osteopathie-kongress.eu>

June 14-18, 2008

June Basic Course
The Cranial Academy
Director: TBD
Indianapolis, IN
CME: 40 Category 1A (anticipated)
Contact: The Cranial Academy
317/594-0411
www.cranialacademy.org

June 19-22, 2008

*Annual Conference: Dynamic
Concepts in Facial Development*
The Cranial Academy
Directors: Eric J. Dolgin, DO, FCA
and Tasha Turzo, DO
Hilton Hotel
Indianapolis, IN
Contact: The Cranial Academy
317/594-0411
www.cranialacademy.org

August 8-10, 2008

The Face (20-hour intermediate course)
Sutherland Cranial Teaching Foundation
Director: Doug Vick, DO
Indianapolis, IN
CME: 20 Category 1A
Contact: Judy Staser, Exec. Secy.
Phone: 817/926-7705
www.sctf.com

October, 2008 (Date TBD)

*An Osteopathic Approach to Chronic
Pain-Endocrine Immune II*
Sutherland Cranial Teaching Foundation
Director: Hugh Ettlinger, DO, FAAO
Biddeford, ME
CME: 18 Category 1A
Contact: Judy Staser, Exec. Secy.
Phone: 817/926-7705
www.sctf.com

Autistic Spectrum Disorder

Margaret A. Sorrell

Abstract

The incidence of autism has risen dramatically in recent years. The common and distinguishing features of Autistic Spectrum Disorders are reviewed. Recent research explores causes ranging from genetic predisposition and heavy metal toxicity to birth practices. Many autistic individuals have associated allergic, immune system and gastro-intestinal conditions. A rapidly expanding array of biomedical interventions is showing promise in improving the quality of life for autistic individuals. A significant percentage of autistic children demonstrate a fairly consistent pattern of osteopathic structural findings, which call for our skill in treatment. The lives and experiences of individuals on the spectrum are offered in a spirit of hope for the future.

Diagnostic Criteria and Incidence

The term Autistic Spectrum Disorders (ASD) includes classic autism (also known as Low Functioning Autism or Autistic Disorder), Asperger's Syndrome (also known as High Functioning Autism), Pervasive Developmental Disorder, not otherwise specified, Childhood Disintegrative Disorder and Rett Syndrome. Autism is an umbrella term used by parents, clinicians and researchers for this wide spectrum of disorders.

Delays or abnormal functioning, with onset prior to three years of age, in social interaction, communicative language, or imaginative play are necessary for a diagnosis of Autistic Disorder. Specific Diagnostic and Statistical Manual of Mental Disorders (DSM IV) criteria include the following:

- A. Two impairments in social interaction:
 - 1. marked impairment in the use of nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures
 - 2. failure to demonstrate developmentally appropriate peer relationships
 - 3. lack of spontaneous seeking to share enjoyment, interests, or achievements with other people
 - 4. lack of social or emotional reciprocity
- B. One of the following impairments in communication
 - 1. delay in, or total lack of, the development of spoken language, without attempt to use alternative modes of communication
 - 2. marked impairment in the ability to initiate or sustain a conversation with others in individuals with adequate speech
 - 3. stereotyped, idiosyncratic or repetitive use of language
 - 4. lack of developmentally appropriate make-believe or social imitative play

- C. One of the following restricted repetitive and stereotype patterns of behavior
 - 1. pre-occupation with one or more stereotyped and restricted patterns of interest
 - 2. inflexible adherence to specific, non-functional routines or rituals
 - 3. stereotyped and repetitive motor mannerisms
 - 4. persistent pre-occupation with parts of objects

In the past, **classic autism** typically presented at 18 months of age after development that may have lacked usual eye contact or vocal expression. Presentation is more varied now with some infants or toddlers developing normally and then suddenly regressing or losing function. Autistic children lack normal social relationships. They often do not bond with their parents and do not play with other children. They prefer to be alone. They show significant delays, or complete failure, to acquire speech. Their performance skills are stronger than their verbal skills. Many fail to develop functional speech and do not even engage in communicative gestures such as pointing or those used for yes, no, or bye-bye. They exhibit echolalia, imitating words just spoken or spoken hours, weeks or years before. They display stereotyped, repetitive, compulsive play involving gross motor, fine motor and verbal rituals. Body rocking, spinning, hand flapping and nonsense sound patterns are examples of this play. Many autistic children have a compulsive need for maintenance of "sameness" in their environment, lining up toy cars in the same pattern repeatedly, and throwing a tantrum if the living room furniture is rearranged.

Asperger's Syndrome is characterized by many of the same behavioral features of classic autism but these children are not delayed in speech development and are not cognitively impaired. Specific DSM IV criteria include the following:

- A. Two of the following impairments in social interaction
 - 1. marked impairment in the use of nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures and gestures
 - 2. failure to demonstrate developmentally appropriate peer relationships
 - 3. a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people
 - 4. a lack of social or emotional reciprocity
- B. One of the following restricted repetitive and stereotyped patterns of behavior:
 - 1. pre-occupation with one or more stereotyped and restricted patterns of interest
 - 2. inflexible adherence to specific, non-functional routines or rituals

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3. stereotyped and repetitive motor mannerisms
4. persistent preoccupation with parts of objects

Asperger's Syndrome children are often obsessed with single topics for months or years. They are socially inept, with no appreciation for the needs or interests of the other person. Their "conversations" are one-sided. They can speak at length on a topic in which they alone are interested. Verbal skills are stronger than performance skills. Their social difficulties are less severe than those with classic autism. They desire social relationships but their attempts are inappropriate. They recognize their difficulties but do not know what to do about them, causing many to be depressed as adolescents.

Children with **Pervasive Developmental Disorder** have some characteristics of autism but not enough to warrant the specific diagnosis because symptoms are mild or some important criteria are missing. They may be diagnosed as Autistic Disorder or Asperger's at an older age or they may improve to a degree that they appear developmentally normal.

The other two ASD diagnoses are quite rare. **Childhood Disintegrative Disorder** looks very much like classic autism but the child's development looks normal for a longer period of time. Regression in development, loss of speech and social withdrawal begin between age three and age ten. Worldwide, one new case is diagnosed each year.

Rett Syndrome occurs only in girls and its incidence is about one in 15,000 individuals. Development looks normal for six to 18 months followed by progressive loss of speech and social skills and the appearance of non-purposeful hand movements.

Autism was first classified in 1943 in the U.S. by Leo Kanner. With the exception of his belief that most autistic children were cognitively normal, the clinical picture he described coincides with the diagnostic criteria now used. In 1944, in Austria, Hans Asperger described a very similar set of characteristics but saw precocious language and high intellect. Both recognized the obsession of these children with themselves, consequently the term autism coming from the Greek *autos* for 'self'. In the 1980s, Dr. Lorna King, from the United Kingdom, coined the term Asperger's to differentiate this condition from classic autism. The Center for Disease Control's recent study cites the prevalence of Autistic Spectrum Disorders at one in 150 children. This translates to 67 individuals in 10,000. Fifty percent have classic autism, 37% Pervasive Development Disorder and 13% Asperger's Syndrome. Between 33 and 62% are cognitively impaired with an IQ 70 or less. In 1990, the prevalence was 18 in 10,000 and in 1984 it was 5 in 10,000. It is generally thought that males are affected about four times as often as females, but in children who are more severely affected, the gender difference is only two to one.¹

Developmental Assessments

Parents accurately recognize developmental problems with their children. Professionals, however, all too often dismiss their concerns. A few simple observations will help determine whether there is true cause for developmental concern. Babies should return a smile by four months of age. They should babble when happy at six months. They should give and take toys by nine

months, play peek-a-boo at 12 months, say three words by 15 months, and 10 words by 18 months. At 24 months, babies on a typical developmental schedule, will put two words together and engage in pretend play. By 36 months, children should answer what, where, and who questions.

Osteopathic physicians, specializing in osteopathic manipulative treatment, might assume that the child's pediatrician or family practitioner will be assessing developmental milestones. This, unfortunately, is rarely the case and a large percentage of children with developmental delays are not identified in a timely fashion. Objective assessments are crucial. The *Modified Checklist for Autism in Toddlers* is an assessment tool for parents. It consists of 23 yes/no questions, designed for use with children between 16 and 48 months. Answering no to any two of the six most critical indicators (ie: Does your child take an interest in other children? If you point at a toy across the room, does your child look at it?) is strongly suggestive of ASD and warrants further evaluation.²

As prevalent as Autistic Spectrum Disorders are, they are not the only reasons young children have difficulty communicating. They may have primary speech and language disorders, anxiety or sensory integration dysfunction. The cause might be a learning disability such as Attention Deficit Disorder or Attention Deficit Hyperactivity Disorder. Several genetic syndromes are known for communication difficulties. Mental retardation is a possibility. The *Modified Checklist for Autism in Toddlers* and other assessment tools, such as *Communication and Symbolic Behavior Scales* and *Developmental Profile* assist in differentiating ASD from other possible developmental problems.

As desirable as it is to obtain a diagnosis, even more important is early intervention. Federal law mandates publicly-funded early-intervention programs which states are required to provide. Early intervention offers the best chance for improvement of ASD. It is imperative that physicians recommend intervention promptly upon recognition of developmental problems.

The Human Side of Autism

Families are severely affected by an autistic child. Parents often find that both can no longer work outside the home. Many day care centers are not prepared to provide services to autistic children. When sensory integration issues are present for autistic children, they cannot perform activities of daily living. They resist assistance from parents or caregivers. The costs of early intervention therapies can be staggering and insurance companies rarely cover the costs, often claiming they are experimental. Couples can find their relationships at a breaking point. The divorce rate is as high as 80%. One resource available to couples is "Family First", a national marital counseling referral program designed to help families in the ASD community stay together.³ A small percentage of couples find their bond strengthened as they struggle to offer the best in medical care and learning opportunities to the child. Siblings often feel resentful at having so much attention placed on the disabled child and will often misbehave in an effort to gain attention. Some can be guided toward empowerment of the autistic sibling through help from parents or counseling.

The children themselves most often benefit from frank and honest communication about their disability, in conversations appropriate to their level of understanding. Nancy Wiseman,

parent, author, and founder of First Signs Inc., tells the story of a seven-year-old overhearing a television news report about autism, ran up, turned off the set and said: "I do not want to hear any more about this autism." The parent got the clue it was time to talk to her child. Another child, age 10, when asked how he felt when his parents told him he had Asperger's Syndrome, said: "Happy – I liked it! Because then I knew what I have had all my life, why I have been getting uptight."⁴

Young adults with autism, offer us glimpses into the social experience of growing up with the condition. The following quotes, compiled by Julie Donnelly, PhD, are from individuals who are in the range of high-functioning autism or Asperger's Syndrome. Many started their lives as "classically autistic, institution-bound cases."⁵

Amy Gravino says, "From 4th through 6th grade, I'd do things to get attention because no one would talk to me or whatever. Then I'd get made fun of and I wouldn't understand why I was getting made fun of. And I'd do it over and over, and it just got worse until a counselor came to me and talked and explained that what I was doing was wrong, and she explained why I was getting made fun of, and I was able to correct my mistakes."

The remarkable part of Amy's story is her last few words: "I was able to correct my mistakes." Many young people are incapable of changing their behavior because they are unable to understand why their actions incite their peers.

Kathy French says, "As a young child and teenager, TV helped to frustrate me. I didn't have judgment to know what was real and not real. I was scared of a lot regarding what I saw. I would think about it all day and then have nightmares."

Listening to ASD individuals is vitally important. Objective observations cannot tell us enough to formulate useful interventions.

Sara Miller relates: "I can't think myself out of a brown paper bag, socially. When I run into a situation that's totally different than something I've been in before, from a common sense point of view, I can't figure out what to do. It's got to be something that I've seen someone else do before, so that I can mimic them or I need someone to tell me what to do."

This difficulty in judging social appropriateness was the subject of a small research study comparing a group of 19 autistic children and adolescents to 19 control children matched for age and IQ. When asked to judge the inappropriateness of the social interaction of a videotaped scene, the autistic group was much less able to do so for scenes that included verbalizations. For scenes that were nonverbal the autistic group was on a par with the control group in judging appropriateness.⁶

Social deficits are a significant factor for young people with Asperger's Syndrome. They are also hampered by serious impairments in executive function which keep them from meeting deadlines, managing money, and prioritizing time. This difficulty can be the deciding factor between success and failure in the home, school or work environment.

Adult Outcome in Autism

It has long been accepted that prognosis for autistic individuals with lower Intelligence Quotient (IQ) is worse than for those with higher IQ. Sixty-eight autistic individuals with performance IQ of 50 or more were evaluated as adults in a British study. Most

adults remained dependent on family or other supports. Very few lived alone, had close friends, or permanent employment. Communication remained impaired and reading and spelling abilities were poor. Stereotyped behaviors persisted for many. Individuals whose IQ was at least 70 fared better. Fifteen percent of these adults had developed a seizure disorder.⁷ Seizures are a co morbid condition in autism with the onset often in adolescence or earlier. A Japanese study of 130 individuals found a seizure prevalence of 25% and concluded that autism was a high risk factor for epilepsy.⁸ An associated seizure disorder worsens the prognosis and is associated with a shortened life span.

Causative Factors in Autism

Genetics

With the huge increase in occurrence of autism in the last 10-20 years, much attention has focused on searching for causes. Some researchers are focusing on familial links, others on genes, some on brain morphology and others on mercury toxicity, while others are focusing on gut disorders, infectious agents, or allergens. Questions are being raised on the impact of the changes in birthing practices in the last decade on the occurrence of ASD.

Geneticists cite the discovery of autism susceptibility genes, which prompts the assertion that Autistic Spectrum Disorders are among the most heritable of all neurologic disorders. Ten to 20 interacting genes appear to be involved. In addition, several genetic syndromes and chromosomal anomalies are associated with ASD.⁹ These associated disorders of known or suspected genetic origin were identified in 12% of 187 children on the autistic spectrum. They include Tuberous Sclerosis, Down syndrome, Fragile X syndrome, Klinefelter syndrome, XYY syndrome, chromosome 17 deletion, chromosome 46, and Mitochondrial disorders.¹⁰ It is clear that a wider vision of cause is needed as genes do not alter dramatically enough in 20 years as to account for the huge increase in incidence. We need to consider the possibility of environmentally-induced chromosomal damage.

Parents sometimes recognize similar difficulties in themselves when they are confronted with the diagnosis in their children. Some studies support the "folk psychology" assertion that fathers and grandfathers of autistic children are over represented in fields such as engineering, math, computers, and accounting.¹¹ These individuals often have remarkable skills in such fields. The author's practice has a large percentage of autistic patients whose parents work at Microsoft.

Brain Anatomy and Chemistry

Studies show abnormal brain overgrowth in the first two years of life, mostly noted in the cerebral, cerebellar and limbic structures that are related to higher order cognitive, social, emotional and language functions. The more abnormal the brain growth the more severe the clinical outcome. Head circumference at birth is, on average, in the 25th percentile. By 12-14 months the excessive and rapid growth yields an average circumference in the 85th percentile. The excessive growth is followed by abnormally slow growth between age two and four.¹² The timing of these aberrations coincides with the laying down of neural pathways, growth of axons, dendrites and synapses.

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These growth processes are usually guided by experience and learning, but when they take place rapidly, the brain may be creating abnormal connections, which makes the job of making sense of the world a challenging one for the child.

In addition to these gross changes, Courchesne, et. al., have noted abnormalities in the frontal and temporal lobes, including increases in gray and white matter, metabolic disturbances, and reduced activation when social, emotional, cognitive and attention tasks are attempted. Cerebellar abnormalities include reduced number and size of Purkinje neurons in the vermis and hemispheres.¹³

From the perspective of brain function, it has been hypothesized that the empathizing deficits of autistic individuals may have a brain basis in the amygdala and left medial frontal cortex. The osteopathic significance of left medial frontal cortex will become apparent. This difficulty in empathizing underlies three impairments in autism: social difficulties, communication difficulties and imagining others' minds. Simon Baron-Cohen has characterized autism as the "extreme male brain" in recognition that the strengths and weaknesses are those of males, but manifest in ASD to extremes.¹⁴

Researchers are still looking for a brain basis for the strong systemizing drive seen in individuals on the autistic spectrum. The classic strengths of attention to detail, deep and narrow interests and islets of ability are functional manifestations of their strong systemizing abilities. These same strengths and weaknesses are often seen in family members in a weaker manifestation.¹⁵

An analysis of brain chemistry shows abnormalities. A significant percentage of patients with autism show elevations in antibodies against gliadin and cerebellar peptides. This finding, alongside the decreased number and cell size of Purkinje cells in the cerebellum, likely contributes to some of the neurologic symptoms in autism.¹⁶

A study of one mother of three children (first born normal development, second with autism and third with a severe language disorder) was found to have serum antibodies capable of binding to rodent Purkinje cells and other neurons, lending even more strength to the likelihood that these antibodies are neurotoxic.¹⁷ Postmortem analysis of cerebellar brain tissue shows abnormalities in the glutamate neurotransmitter system in the cerebellum.¹⁸

Vaccines and Heavy metal toxicity

Whether vaccines play a part in autism is a continuing controversy. The Institute of Medicine's Immunization Safety Review Committee examined epidemiologic evidence extensively and stated that this evidence "favors rejection of a causal relationship between thimerosal-containing vaccines and autism". They arrived at the same conclusion regarding the MMR vaccine and autism.¹⁹ Subsequent challenges pointed to methodological flaws. National and international scientists have testified before U.S. Congressional committees that mercury in vaccines is a contributing factor in the development of neurologic disorders including autism.²⁰ In spite of the controversy about a causative role of vaccines, there is no dispute that mercury is a neurotoxin and the stabilizer thimerosal, which was used to stabilize almost all U.S. vaccines until 2004, is 49% mercury

by weight. Thimerosal is still used as a stabilizer in some vaccines. The neurotoxic risks of mercury are twice as high for a five pound baby as they are for a 10 pound baby and a two month old is at higher risk than a six month old, both from the perspective of size and in the relative maturation of the central nervous system.

A history of thimerosal use and extensive analysis of both the research and the controversy is found in David Kirby's book, *Evidence of Harm, Mercury in Vaccines and the Autism Epidemic: A medical controversy*.²¹ Thimerosal was first marketed for vaccines in the 1930s and autism was first defined in the early 1940s. The sheer number of childhood vaccines caused vaccine related mercury exposure in the U.S. to more than double in recent years. The prevalence of autism in the U.S. is one in 150 children. In Denmark, where thimerosal was removed from vaccines in 1992, the autism rate is one in 1,300.

In 1999, the American Academy of Pediatrics and the Public Health Service stated that some children could be exposed to a cumulative level of mercury exceeding federal guidelines by six months of age. Within a month of this pronouncement the Food and Drug Administration approved a request by Merck for a thimerosal free pediatric Hepatitis B vaccine. In 2000, the Center for Disease Control Advisory Committee on Immunization Practices reported a statistically significant association between thimerosal and neurodevelopmental disorders.

Mouse neuronal cells exposed to aluminum showed a 90% survival after 24 hours and cells exposed to antibiotics showed a survival rate of 80%. Those exposed to thimerosal showed only a 30% survival rate after 24 hours. When mouse neuronal cells were exposed to thimerosal and estrogen, most were alive 24 hours later. But those exposed to thimerosal and testosterone died a hundred times faster than those exposed to thimerosal alone. These findings may shed light on the greater incidence of autism among boys.²²

Autistic children had a higher mercury exposure during pregnancy due to maternal dental amalgams and thimerosal-containing immunoglobulin shots. It appears that children with autism are less capable of detoxifying mercury. They have been documented to have low levels of glutathione, an intracellular antioxidant and detoxifying agent. Methionine synthetase, needed for biomechanical steps in brain development and in production of glutathione, is found in low levels several days after mercury or thimerosal exposure in vitro. Repeated doses of thimerosal lead to neurobehavioral deteriorations in autoimmune susceptible mice.²³

The Mumps, Measles and Rubella vaccine (MMR) has been frequently cited by parents and researchers as causative in autism, but MMR is a live virus vaccine which does not contain thimerosal. This vaccine happens to be given at about 15 months of age, shortly before the age at which autistic signs become more clearly evident in most affected children. Some children develop diarrhea or signs of inflammatory bowel disease following vaccination with MMR. If there is a causal relationship between MMR and autism, it should be linked to the complications of a leaky gut prompted by the MMR. More discussion of this factor will follow.

A recent study examined the cumulative incidence of autism up to age seven in a population center of 300,000 in Japan in

which the MMR vaccination rate declined significantly between 1988 and 1992. The use of MMR ended after 1993. The incidence of autism increased significantly in the birth cohorts of years 1988-1996 and rose dramatically beginning with the birth cohort of 1993. The reviewers conclude that the MMR is unlikely a main cause of autism.²⁴ In spite of these MMR epidemiology based results, the anecdotal evidence of harm speaks for itself. Most of us who are treating autistic children can tell the story of at least one child who changed from a typical child to one with clear autistic symptoms within weeks of the MMR vaccine. As is often true in research, the findings fuel more questions. The Institute of Medicine's Immunization Safety and Review Committee made extensive recommendations for further studies concerning vaccines and autism.

Associated Health Problems

The relationship between autism and other health problems is the subject of much research. Similar to complex autoimmune disorders, infectious agents, toxins and diet appear to play a role in autism. Dietary peptides (gliadin and casein), bacterial toxins and thimerosal bind to lymphocyte receptors and/or tissue enzymes resulting in an autoimmune reaction in children with autism.²⁵ The autoimmune theory is supported as well by high levels of total serum protein and IgGs.²⁶

Allergies, G-I illness and immune system abnormalities are common in children with ASD. The limited language skills possessed by many of these children prevent them from communicating their medical distress. Poor sensory function can exacerbate some medical conditions, such as constipation. It is important for physicians and parents to recognize that these children may use other means of communication to signal medical distress. For example, tantrums may be a response to pain.

There is not yet a consensus as to whether these medical problems contribute to the neurologic symptoms in children with autism, but the evidence is mounting. Biopsies from the duodenum, ileum and colon all show a prominent mucosal eosinophil infiltrate in autistic children that is significantly lower in those on casein and gluten free diets.²⁷ It is theorized that the excessive opioid activity linked to the peptides from gluten and casein may have a causative role in autism. These peptides should be absorbed through the GI tract but in the case of leaky gut (which may have been prompted by the MMR vaccine), they pass through holes in the intestinal wall, are absorbed into the blood stream and cross the blood/brain barrier. These peptides have been reported in the urine and cerebrospinal fluid of people with autism. A review of small scale studies assessing autistic traits in individuals who had casein and gluten removed from their diets did not support changes in cognitive, language or motor skills but did show a significant reduction in autistic behaviors.²⁸

Gastrointestinal symptoms for some children are connected to allergies and for others may be due to an imbalance of indigenous gut flora. Imbalances allow for the overgrowth of pathogenic micro-organisms. Children on the autistic spectrum have higher levels of *Clostridium histolyticum* group. These are known toxin producers which contribute to gut dysfunction. Their metabolic products have systemic effects.²⁹ Measures to

improve gut microflora and reduce clostridium levels improve G-I symptoms, malabsorption and, anecdotally, improve behavior in children with autism.

Many research studies have been done trying to document the benefits of secretin, a gastro-intestinal hormone which has been touted as an effective treatment. A recent review of multiple secretin studies concluded that neither single nor multiple dose IV secretin is effective in addressing the core features of autism (social interaction, communication and behavior problems).³⁰ This again does not do justice to the many individual children who appear to have benefited. A single study showed that children with chronic, active diarrhea showed reduction in aberrant behaviors when treated with secretin vs. placebo. Children with no GI symptoms were unaffected.³¹ Further research is indicated as secretin immunoreactivity has been demonstrated in several places in the brain, including the Purkinje cells of the whole cerebellum, in some of the neurons of the central cerebellar nuclei, and in neurons in the primary sensory ganglia.³²

Environmental factors, such as infections or toxic exposure in utero or after birth, may play a part in triggering autism in those children who are genetically susceptible. A large Danish study showed a higher risk of autism with breech presentation, low Apgar score at five minutes, gestational age at birth less than 35 weeks, and a parental history of schizophrenia like psychosis or affective disorder.³³ Prenatal stressors were the focus of another study prompted by pathologic cerebellar changes in autistic individuals believed to correspond with an event between weeks 21 and 32. Surveys given to mothers of autistic children (and compared to surveys of mothers of neurotypical children) showed a higher incidence of prenatal stressors at 21-32 weeks gestation, the stressors peaking at 25-28 weeks.³⁴

Birth Practices and Autism

Coincident with the increased prevalence of ASD has been increased use of pitocin to augment contractions in labor. There has been little research into the possible causative connections with this change in birth practices but both parents and clinicians are concerned. Often the intensity of these pitocin augmented contractions require an epidural which addresses the mother's pain level but not the intrauterine experience of the fetus. If this level of stimulation is excessive for the mother, it may also be excessive for the infant. It seems plausible that the infant's response would be to retreat into his/her own world, shunning social and verbal interaction.

It is possible that the higher exposure to oxytocin in labor, by pitocin induction, may cause a downregulation of the oxytocin receptors in the developing brain. Although one study did not support a connection between pitocin induction and neurodevelopmental abnormalities,³⁵ a literature review cites the capability of oxytocin to cross the maternal placenta and the stressed blood/brain barrier of the infant and proposes a causal connection between oxytocin excess and behavioral disorders such as autism.³⁶ Further studies are indicated to address several related questions. Do mothers of affected children have lower levels of endogenous oxytocin? What is the correlation between strength of contractions and incidence of autism?

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Alongside the increase in pitocin use in labor has been a higher incidence of ultrasound during pregnancy. A recent study on ultrasound exposure in pregnant mice showed a statistically significant number of neurons fail to migrate to their appropriate positions in the cerebral cortex. More neurons are affected with longer exposure.³⁷ Further research is needed to evaluate the effects on larger mammalian brains and whether this lack of full migration is significant in autistic spectrum disorders.

Alongside these considerations about birth practices, the fact that autism seems to run in families might be connected in part to the shape of the maternal pelvis yielding a consistent strain pattern at birth.

Developmental and Medical Approaches to Treatment

In addition to osteopathic manipulative treatment, several medical and developmental approaches appear to have merit in addressing autism. It is difficult to assess the value of any one approach as many approaches are usually used simultaneously.

There is widespread agreement on the value of early intervention. Autism is a progressive disorder and early deficits in communication and social responsiveness have a negative impact on the development of more complex social and communication skills. Perseverative and ritualistic behaviors interfere with learning appropriate behaviors. Brain plasticity supports early intervention. Over time, as brain cells develop and migrate to specific locations, they differentiate and assume specific functions. Interventions, including osteopathic manipulative treatment, especially in the early post natal period and through the toddler years, can have a huge and positive effect on the development of the brain and offer the possibility of minimizing the expression of autistic spectrum disorders.

Many of the standard developmental approaches of speech, occupational and physical therapy benefit children with autistic spectrum disorders. Some need more specialized approaches that address the sensory abnormalities often seen in ASD. These may be addressed through Sensory Integration Therapy or more specific interventions such as Auditory Integration or Vision Training.

A mainstay of early intervention is stimulating *back and forth* communication aimed at the child's developmental level. Anything a parent or therapist can do to keep up a dialogue, in smiles, laughs, gestures, pretend play, or imitation is to be encouraged. Active work to attain this is indicated several times a day for 20 minutes or more each session. Applied Behavioral Analysis is an intense method (25-40 hours a week) which teaches a child specific skills and behaviors in a systematic way using repetition and rewards. A few Applied Behavioral Analysis practitioners also use aversive stimulation, including electric shock as a deterrent.³⁸ Treatment and Education of Autistic and Related Communication Handicapped Children is a method that focuses on changing the environment to facilitate learning. It advocates creating a highly structured classroom with work stations and certain areas for specific tasks separated by visual boundaries. Controlling sensory stimulation is imperative. Low ceilings, muted colors, a minimum of natural light are not good design choices for a school for typical children, but they are essential for the learning environment of autistic children. With

the huge number of children affected by autism it is imperative to create learning environments that maximize the possibility of their learning. Their social deficits make it difficult to mainstream them in traditional public schools.

There is no such thing as the best treatment for autism. A good school and/or treatment program is one that can offer an array of options with the flexibility to tailor them to the needs of the individual child. Parents and professionals should strive to make choices that they believe are helping these children to reach their fullest potential. At the same time, we must not lose sight of loving and appreciating them for the people they are.

School age children struggle with appropriate social relationships. A study of five children was undertaken, in which each autistic child was paired with two neurotypical peers. The peers were taught to use several facilitative social skills with the autistic children. Four out of the five autistic children showed improvements in social-communication skills after five days. All children, in addition, showed increased use of three different communication skills that were taught by written text cues. These two approaches show promise in improving friendships and social relationships in school age autistic children.³⁹

Allopathic medicine offers a few pharmacological therapies that have served to manage some symptoms in children with ASD. Risperidone can calm irritable or disruptive behaviors. Antidepressants of the "SSRI" class may be helpful for more severe perseverative behaviors or high anxiety. There is no medication that appears to address the core symptoms, especially the profound impairments in social interaction and communication.

Homeopathic remedies directed toward reversing or ameliorating the effects of vaccines has made a big difference to some children, demonstrated by better cognition and/or socializing behaviors. A few anecdotal reports credit a constitutional homeopathic remedy as having been curative for a particular child.

Neurologic benefits are seen in children when allergens are removed or otherwise treated. The trouble that autistic children have with casein and gluten was outlined above. Kent MacLeod, an authority on nutritional biochemistry for children with developmental disabilities, has noted dramatic improvements in about one-third of children placed on casein and gluten free diets. Another third have shown moderate improvement. When the immune system is not called upon to mount a response to casein and gluten, it is available for useful immune work. Yeast overgrowth, often stemming from antibiotic use, is common in autistic children, but there is no consistent response to treatment. Children who test with high levels of yeast may not show benefit from treatment, and children whose tests suggest there is no yeast problem sometimes benefit greatly from treatment.

Specific nutritional therapy holds hope for helping to detoxify heavy metals which cause damage in two ways. Heavy metals can compete with essential minerals such as iron, zinc and copper, thus creating a deficiency of these minerals. Mercury specifically creates its neurotoxic effects by binding to the sulfhydryl groups on the most abundant protein in the brain, tubulin. Blocking of these sulfhydryl sites destroys the brain cell. Some protection is provided by glutathione, an intracellular antioxidant consisting of the amino acids L-glutamine, L-cysteine and glycine. Glutathione is a sulfhydryl scavenger and in adequate amounts helps protect the brain against heavy

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metal toxins. Because glutathione is not absorbed well we are dependant on our ability to reactivate that which we have circulating, a process which is done enzymatically with the help of selenium and glutathione peroxidase. Supplementation of these nutrients, as well as Vitamin C, E and coenzyme Q10, which assist in the reactivation of one's own circulating glutathione, can address, more effectively, the neurotoxicity of heavy metals. Many children are aided by chelation, which binds the toxic metal and renders it ineffective. Chelation has its attendant risks and should only be done by a skilled clinician.

Lipid metabolism is another concern in autism. Omega-3 fatty acids are essential to brain development and function. Male brains have higher fatty acid requirements and therefore suffer more greatly with deficiencies. Could this contribute to the higher incidence of autism among males? Supplementation of fatty acids is indicated in autism.⁴⁰

These developmental, nutritional and chemical problems are being considered by many clinicians. The Autistic Research Institute is at the forefront of this. The Defeat Autism Now program trains physicians and others to consider individual-specific variations in biochemical pathways, and to address strengthening the rate limiting steps, or individual relative deficiency states.

Osteopathic Structural Considerations

What are the osteopathic considerations that we should consider? Lawrence Lavine, DO compiled a list of strain patterns commonly found in a sample of twenty-five autistic children examined between 1995 and 1999.⁴¹

In this patient, population whose median age at first visit was three years, 22 of the 25 children demonstrated left-sided cranial compression and/or restriction in the left middle cranial fossa. Palpable restrictions were evident in the left frontal temporal sphenoidal articulation regions extending to the sphenosquamous pivot area and left zygoma. The consistency of this finding appears highly relevant in light of the research cited which showed deficits linked to the left medial frontal lobe. For the three children who did not show this pattern, one exhibited a cranial torsion, and the other two had lateral strains with significant plagiocephaly. In all 25 children, bilateral condylar compression was noted and sacral motion was restricted.

Every child had a hyperflexed sphenobasilar symphysis resulting in tension in the falx cerebri exerting a compressive force on the corpus callosum. The associated flattening of the tentorium cerebelli results in compression of the cerebellar space. The research cited showed cerebellar abnormalities, loss of Purkinje cells, neuronal antibodies and abnormal cerebellar peptides. In 22 of 25 children, a sacral torsion was found.

In all children, the motion of the thoracic diaphragm was out of phase with the other two diaphragms (tentorium cerebelli and pelvic diaphragm). The inherent motion of the central nervous system was compromised and pelvic restrictions through bilateral inominates were noted in all children.

For those familiar with osteopathic biodynamics, 22 of 25 showed a 90 degree to the left deviation of the midline posterior-anterior energy flow at the level of the sella turcica. In all children, the motion of the third ventricle and the ignition system through the third ventricle were impaired.

The remarkable consistency of these findings suggests that

the biomechanical forces of birth are a significant factor. Labors that are augmented by pitocin are often lengthy labors and the findings suggest consistencies in the shape of the maternal pelvis. Many osteopathic clinicians have observed that when the maternal pelvis is treated, cranial distortion is not seen in the newborn.

Dr. Lavine treated all 25 of the children with osteopathic manipulation and all received one or more other interventions: dietary, homeopathic, or other medical or developmental therapies. In 1999, as part of the Autism 99 online conference, Dr. Lavine reported that 15 of the children were communicating in sentences of four words or more, initiating social contact and demonstrating spontaneous imaginative play. One child appeared to be fully recovered. Eleven were in regular preschool, kindergarten or grade school with some assistance, and 13 were in special school programs for autistic children.

Viola Frymann, DO, demonstrated an improvement in developmental scores with osteopathic manipulation in both neurotypical and learning disabled children.⁴² Stephen Blood, DO, demonstrated the benefits of osteopathic manipulation with a slowing of brain waves in children with ADD/ADHD, on electroencephalogram.⁴³ There is anecdotal and preliminary study information that this is also the case for osteopathic manipulation in children with autism. In addition to the direct benefits of osteopathic treatment, it is likely that removing the structural restrictions will enhance the benefits of other therapies. When strains in the tentorium cerebelli are released the cerebellum has adequate space for growth. When the pressure on the corpus callosum is relieved, the cerebral hemispheres can communicate with one another. Release of restrictions in the left temporal lobe allows for better function of Broca's speech center. Some of these children may have been trying to acquire language through the smaller speech center in the right temporal lobe prior to release of these left middle cranial fossa restrictions. Improvement of language, through release of these temporal restrictions, may lend support to the recent hypothesis that temporal processing deficits cause language impairments.⁴⁴

For many osteopathic physicians, the thought of treating an autistic child is daunting. Their extreme behavior can be challenging. Many of them refuse to be touched, or refuse to lie down. Some pull your hands off their bodies; some hit you, are belligerent or ballistic. Here are a few suggestions to make the process easier:

Begin the process by making friends.

Get down on the same level with the child, but do not get in his/her face.

Find out if there is a particular kind of touch that is comforting.

I have a boy who comes to my office for "squishies". If I tell him I will give him squishies (firm squeezes of his arms/hands/legs/feet) he climbs up on the table. I fulfill my promise and then proceed to give him an osteopathic treatment.

In particularly, difficult cases allow the child to be entertained by an educational DVD. It may not be optimal, but it allows the child to cooperate with treatment.

I will work on a child that is sitting up, or even standing and moving along my toy shelf if that is where I can gain cooperation. In the most difficult cases, the first visit may only accomplish a

familiarity with the office and a willingness to come back. That will, however, pave the way for the future. Another boy I see, used to require lovingly applied bodily restraint to stay on the table. He now walks into the treatment room with a smile on his face, climbs onto the table on his own and lies quietly. He recognizes the benefits he gains from treatment. Be grateful for small changes, they make a world of difference to these families.

The Future

Answers are not yet available which elucidate clear causes and provide treatments and social structures that will assist those with autism. The future will be instructive as it reveals the results of continuing research. Current treatment strategies reflect current knowledge and can be expected to change as knowledge of the autistic disorders increases. Many autistic patients can be successfully employed in appropriately constructed work environments. Effective treatment also means devising ways to incorporate individuals with autism into the educational, employment and social realms of modern society.

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CME QUIZ

The purpose of the quiz found on the next page is to provide a convenient means of self-assessment for your reading of the scientific content in the "Autistic Spectrum Disorder" by Margaret Sorrell, DO. Answer each of the questions listed. The correct answers will be published in the June 2008 issue of the *AAOJ*.

To apply for Category 2-B CME credit, transfer your answers to the AAOJ CME Quiz Application Form answer sheet on the next page. The AAO will record the fact that you submitted the form for Category 2-B CME credit and will forward your test results to the AOA Division of CME for documentation.

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READ the following articles for AOA CME credits.

Name of Article: "Autistic Spectrum Disorder"
Authors: Margaret Sorrell, DO
Publication: *Journal of the American Academy of Osteopathy*, Volume 18, No. 1, March 2008, pp 11-19

**Mail this page with your quiz answers to:
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*Answer sheet to
March 2008
AAOJ CME quiz
will appear in the
June 2008 issue.*

December 2007
AAOJ CME
quiz answers:
1. A
2. A
3. E
4. A
5. A
6. E
7. E

CME QUIZ

1. In classic autism developmental concerns arise:
 - a. at about 10 months of age.
 - b. between 3 months and 12 months of age.
 - c. between three and 10 years of age.
 - d. at variable times before about 18 months of age.
 - e. none of the above.
2. Which of the following treatment modalities hold promise for autistic children?
 - a. occupational therapy
 - b. sensory integration therapy
 - c. homeopathy
 - d. osteopathic manipulation
 - e. all of the above
3. Autism is seen in higher incidence among:
 - a. children of lower socio-economic class.
 - b. children born after 42 weeks gestation.
 - c. children of engineers and computer technicians.
 - d. second born children.
 - e. none of the above.
4. Signs of Autism often include:
 - a. lack of eye contact.
 - b. poor verbal skills.
 - c. repetitive motor mannerisms.
 - d. lack of peer relationships.
 - e. all of the above.
5. The current prevalence of autism is about:
 - a. 1 in 10,000.
 - b. 1 in 1,300.
 - c. 1 in 1,000.
 - d. 1 in 600.
 - e. 1 in 150.
6. Timerosol, a vaccine stabilizer is:
 - a. proven to be causative in autism.
 - b. proven not to be causative in autism.
 - c. 49% mercury by weight.
 - d. used to stabilize the MMR vaccine.
 - e. no longer used to stabilize any vaccines.
7. Which of the following birth histories appear to be associated with a higher incidence of autism?
 - a. C-section
 - b. pitocin and epidural anesthesia
 - c. episiotomy
 - d. high birth weight
 - e. labor longer than 24 hours
8. Head circumference in autism is usually:
 - a. normal at birth, large at one year.
 - b. larger than normal at birth, normal at one year.
 - c. smaller than normal at birth, large at one year.
 - d. larger than normal at birth, large at one year.
 - e. larger than normal at birth, small at one year.

Osteopathy: In Good Hands (and I don't mean Allstate®)

Hollis H. King

Today I want to address the state of the art of the practice of manual medicine from the perspective of osteopathic manipulative treatment (OMT). I want to talk about “what is right with the osteopathic medical profession” elaborating on some of the progress made in support of osteopathic principles and practice (OPP), then some opportunities and challenges to the profession. I want to do my best “to tell it like it is”.

We all stand on the shoulders of giants. The giant's shoulders I climbed on were those of Viola M. Frymann, DO, FFAO.

I got to Dr. Frymann via a circuitous route. My wife, Susan, has a phrase, “God writes straight with crooked lines.” This means we may not understand the meaning of all that is happening to us, but there is some purpose to it all that may eventually be revealed.

When I was working on my PhD in Psychology, I did my dissertation on hypnosis and dreams. As part of my training, I was hypnotized. During one session, my psychology professor asked me what I should do in life. From the depths of my unconscious came the advice that I should be a “psychiatrist” or an “Osteopath.” At the time I thought becoming a psychologist was sufficient for following my own advice, but it really was not. Psychiatrists and osteopathic physicians have the full scope of medical practice license, and psychologists do not. Too often in my practice of clinical psychology, my hard work with a patient, using talk-oriented psychotherapy, was literally blitzed by a psychiatrist's prescription of some psychotropic medication.

In the early years of my clinical psychology practice, the College of Osteopathic Medicine of the Pacific was just getting started. There was a well-known Osteopath in town who was involved with that college. Viola Frymann was her name.

I called her office and I bravely told Dr. Frymann I was interested in osteopathic training. She said she would see me. I went to her office at the appointed time. She had me sit in on a new patient evaluation, the consultation with the family, and then I got my interview. During the interview, she asked me when my birthday was, and I thought, “Oh boy she will think I am too old.” Before she dismissed me, Dr. Frymann said “When you become an Osteopath, come and look me up, I might have a job for you”. What an empowering thing for me to hear. This well-known established Osteopath thought I could really do it – become a physician. It was inspiring and it is something for which I will be grateful forever.

Today Osteopathy and osteopathic medicine face a number of challenges, but there are great opportunities if we proceed wisely.

It is almost a miracle that Osteopathy has survived despite itself and those who have populated its ranks. It is somewhat like the Roman Catholic Church that has survived despite some of the more notorious Popes – and I say this as a Roman Catholic.

I suggest that Osteopathy may have been divinely inspired, and is too important for the health and welfare of the world to be stamped out by competing medical practices and philosophies. I believe we can only be destroyed from within, that is if the osteopathic profession betrays its birthright and stops teaching what Andrew Taylor Still started.

The situation we face in the osteopathic medical profession is somewhat analogous to the story of Abraham arguing with God in the Book of Genesis, Chapter 18, about destroying Sodom and Gomorrah, which were apparently very sinful places. Abraham asks if God would destroy the righteous with the wicked if 50 righteous people could be found? God says no, if I can find 50 righteous people, I will not destroy the place for their sake. Then Abraham goes back and forth with God, negotiating if you will, about not destroying the place if there are 45, then 40, then 30, then 20, and down to 10 righteous people. We know how it ended, in Genesis, Chapter 19, Sodom and Gomorrah are destroyed and Abraham and his family get out minus, Lot's wife.

How many DOs need to practice Osteopathy for the osteopathic medical profession to continue to exist?

Think about it.

What if our research establishes the evidence base for OMT, but there is no one to do it?

In my opinion, it is not so much a “numbers game” as it is a mental, attitudinal matter for those who practice with a license, which allows the “full scope of medical practice”, and hold either the Doctor of Osteopathy or Doctor of Osteopathic Medicine degree.

I have always been an optimist, a glass half-full kind of person, so while I want to talk about my perspective on the state of Osteopathy and osteopathic medicine and the very real challenges to our existence, I choose to be as positive as I can be.

I believe Osteopathy is in good hands.

I want to consider those aspects of our profession that support Osteopathic Principles and Practice:

Osteopathic Culture

Educational Council of Osteopathic Principles (ECOP)

National Board of Osteopathic Medical Examiners

(NBOME)

Research on OMT and Osteopathic Manipulative Medicine

Professional organizational support

→

Then I want to consider our relationship with other manual medicine – manual therapy professions and the rest of the world.

Osteopathic Culture

It helps to look at things from the perspective of our culture – the USA – the world - as far as health care is concerned.

With my optimism and belief that osteopathic medicine is the best, most complete school of medical practice, I ask,

“Is the culture of medicine and medical practice catching up to Osteopathy?”

Holism and “wellness” are gaining in public support and in clinical practice. Osteopathic physicians are already there; ready to lead the pack, if we would just do so.

We do have an osteopathic culture. Some think it is dead, some wished it never happened, but the power of what Andrew Taylor Still elucidated and taught is a very real “something” that we have all been trying to define and capture in some understandable way. I think it is difficult to capture its totality in some succinct way, that is agreeable to everyone, because what Andrew Taylor Still did and said may be divinely inspired. My observation is that we are all on a journey thru life that may or may not have much connection – as we understand it – with the divine.

When someone starts talking about the divine, spirit, or religion, our filters and barriers rise. I am not preaching from any particular religious view point, but this aspect of the spirit and divine has to be mentioned because it is part of our osteopathic culture! Does the AMA begin its meeting like the AOA House of Delegates does with a prayer? It serves my purpose today to take the high ground with regard to references to the divine, I mean the divine in Andrew Taylor Still’s terms. He used terms like the “Master mechanic” and “Nature”. I have given an opinion that Osteopathy exists today because it may be divinely inspired and our good hands are keeping it alive. What we do with Osteopathy will determine its future and the future of the osteopathic medical profession.

Dennis Dowling’s Northup lecture two years ago captured some. I recommend that you read: “What If”?

The osteopathic culture, even if you question my associations with the divine, has elements we have all studied and taught.

Our four osteopathic tenets:

- Structure - function relationship
- Body is self-regulatory and self-healing
- Body is a single dynamic unit of function
- Rational treatment is based on these principles

Matching importance with these four tenets is, “Find the health, anyone can find disease.”

The “Whole person, body-mind-spirit” consideration is also a part of our culture.

Our modern osteopathic culture also has a primary care emphasis.

I suggest that if you do OMM/OMT, it becomes an even more effective practice, one, which is a preventive medicine and wellness, oriented practice. This is almost synonymous

with the traditional Osteopathic culture element of a “patient centered emphasis.”

All of these culture defining elements have been set forth in detail. As individual practitioners and teachers, we tend to emphasize different elements, depending on who we are talking to or how we feel. We can make a living doing a medical practice, or we can justify ourselves as administrators and faculty in osteopathic training institutions.

In the context of osteopathic medicine *Good Hands* can be a major instrument of our work. This is part of our culture.

We osteopathic physicians stand in stark contrast to the rest of medicine, which I think has become tactically defensive. Doctors today do not seem to want to touch patients very much. We say we just do not have time, but I suggest that to actually touch a patient establishes a contact that requires more from the physician than they may be willing to commit in their service to patients. Touching a patient may be “too personal” for some physicians to deal with because of their own emotional needs and problems.

Whether or not we admit or acknowledge it, we physicians do touch even without physical contact. We do it with our very presence, with our eye contact, and our words – *this is the art of medicine*.

Even if you do not touch a patient with a musculoskeletal purpose in mind, physicians use hands to hold charts, write or type in electrical medical records, manipulate a hypodermic syringe, or wield a scalpel. Hands are very important. It does help to have *good hands* for these purposes as well.

In Osteopathy and osteopathic medicine, however, hands are really special and used to the ultimate extent. Think of the osteopathic physician’s hands and the things they can do. The osteopathic hand palpates the body and in that palpation, the hand not only feels beneath the skin and inside the body – it also “sees” and “hears” the inside of the body (as well as the mind and spirit if we are willing to listen). The osteopathic physician has a unique opportunity to touch the very essence of the patient. Those osteopathic hands have the privilege of exploring and reaching beyond the x-ray, beyond the MRI, beyond the incision of the scalpel and beyond the prescription pad.

The hands-on work emphasis in osteopathic training has far more value that we may realize. Perhaps the first two years in the osteopathic medical curriculum with the intense OPP-OMM-OMT classes and practice labs, rubs off better than we suspect. Several studies have presented evidence that suggests that osteopathic physicians interact with patients differently than their MD brethren.

Perhaps many of our DO brethren practice like our MD colleagues because, to imagine the power of the hand makes what the doctor does so personal. It creates a bond between the doctor and patient that is quite extraordinary in its potential for healing and benefit; but it also can be quite demanding of the energy and attention of the physician. Many physicians are not psychologically prepared for this type of interaction. I made a living as a psychotherapist before I went to medical school, and I was already aware of the dynamic interactions possible just by being in another person’s presence for 30 to 45 minutes.

My observation is that, for a particular osteopathic medical student, or resident or osteopathic physician newly in practice, a

“defining moment” occurs. These defining moments can come anytime.

These defining moments tend to determine our course in life and they are hard to teach. Positive or negative defining moment, however, does seem to come in every DO’s training and life experience.

In regard to the comfort in utilizing OMM/OMT in ones practice, there is often an experience of success or suboptimal result that influences how one views the use of our hands in medical practice.

My own defining moment came as a first-year osteopathic medical student. My seven-year-old daughter was taken to a dentist who told us she had a “class two malocclusion,” a bad cross bite, and would need orthodontia. At the time, we did not even have medical insurance, much less dental insurance. I remembered a lecture on cranial Osteopathy taught by John Harakal, DO, FAAO. He was too busy in his practice to see my daughter, so he had me bring her to the class and he did a pediatric demonstration on her. I tried to give my best analysis of the cranial strain patterns that Dr. Harakal described. He showed me the techniques to free the spheno-basilar synchondrosis. The technique was basically a volmer pump and occipito-atlantal decompression, which I did for some months on my daughter. When we returned to the dentist, he was amazed that the mal-occlusion was resolved. That dentist took the dental course that Dr. Harakal offered.

This experience convinced me of OMT efficacy.

Subsequent to that “defining moment”, I took every cranial course I could get into or afford. I have enjoyed a wonderful career in osteopathic medical practice. My emphasis has been on the diagnosis and treatment of musculoskeletal system disorders.

What was your defining moment or experience that gave you the confidence to practice OMM/OMT for a living?

Do our students lack the opportunity to have “defining moments” like these? We, who are practitioners of this particular medical art, should pass on our experiences and provide training in our offices for students that want to learn more. Maybe they should have the kind of experience that I am suggesting here. Not that many osteopathic medical schools have a required rotation in OMM/OMT. If everyone did, that might help in giving our students every opportunity to fulfill a truly osteopathic medical education, what specialty of medical practice they choose.

When the opportunity comes to help an OMM Department by taking students who want an OMM training experience – do it.

I will present what I think our profession has done for us, but to paraphrase President John F. Kennedy: “Ask not what your profession can do for you, but what can you do for your profession?” This attitude worked for Kennedy; perhaps it will work for Osteopathy and osteopathic medicine.

Educational Council on Osteopathic Principles (ECOP)

One thing that is certainly right about the osteopathic medical profession is ECOP.

One of the main supporters and promulgators of osteopathic medical culture is ECOP. Sponsored by the American Association of Colleges of Osteopathic Medicine (AACOM), this council is made of the chairs, or their representatives, of the

departments or sections of Osteopathic Manipulative Medicine in all the Osteopathic medical schools.

I also suggest that AACOM, in sponsoring ECOP, is also one of the positive forces within the Osteopathic medical profession.

ECOP meets regularly and works to define the nomenclature of OPP/OMM/OMT and have been working for years on developing a so-called “standard curriculum” for OPP/OMM/OMT.

As long as ECOP functions fully, I would suggest that Osteopathy is indeed in good hands.

In the OPP/OMM/OMT curriculum a “DO mind set” can and should be established. I do not think there is enough emphasis on “thinking Osteopathically,” that is, actualizing the four tenets and related medical philosophy in daily medical practice. My understanding of Andrew Taylor Still’s writings is that if all physicians, no matter which medical degree was earned, would think and practiced with a “DO mind set” his mission in life to improve the practice of medicine will have been fulfilled.

Osteopathic physicians staffing the faculties of the osteopathic medical schools are vital to the furtherance of attaining the high goals and potential of osteopathic medicine and could be considered the backbone of the profession – no pun intended. I have heard that there are a number of vacant positions in OMM department faculties and encourage all who may read these words to consider looking into teaching opportunities in OMM departments around the country.

National Board of Osteopathic Medical Examiners

I believe it important in the context of the Northrup Lecture to acknowledge the Osteopathic medical organizations and entities that forward Andrew Taylor Still’s dream for improved health care.

The osteopathic medical profession does much good to promulgate OPP/OMM/OMT, and the National Board of Osteopathic Medical Examiners’ (NBOME) process. Any of us who have taught in an OMM department have had to write questions for the Comprehensive Osteopathic Medical Licensing Examination (COMLEX), the board examinations.

I am favorably impressed with the way this testing is done. It is a scientific and validated set of examinations and does require significant understanding of OPP/OMM/OMT on the part of the student. One wonders how much of it is retained, however, and whether or not a particular student only grudgingly approached the review of the necessary content to pass the exam, but at least I think there has to be some level of learning in the preparation for the boards.

I recently participated in the validating process for COMLEX Level 2-PE at the National Center for Clinical Skills Testing. We experienced a sample of what the students experience under the guidance of John Gimpel, DO and Dennis Dowling, DO and the Conshohocken, PA center staff.

My observation is that OPP/OMM/OMT is well represented and integrated and that “thinking Osteopathically” is required on this COMLEX test of clinical skills.

With ECOP and NBOME, Osteopathy and osteopathic medicine are in good hands.

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Research

I believe that the goodness of Osteopathy and osteopathic medicine will survive in the minds and hearts of those who have experienced benefit from application of the osteopathic principles. We are, however, in an age of science dominated by biological reductionism. Biological reductionism is inherently anti-osteopathic because of the basic assumptions underlying this perspective. Biological reductionism posits that everything can be reduced to and explained by the natural laws of chemistry, physics, and biology. There is no room for concepts such as spirit. Functions of the mind and emotion can all be explained by nervous system activity and biochemical processes, many of which have not been discovered yet. "Science" is constantly striving to dig deeper into the "black box" of the human body and brain.

For the past two and a half years I have had the opportunity to work on the staff of the Osteopathic Research Center (ORC) located on the campus of the Texas College of Osteopathic Medicine.

At the ORC, we have been very busy conducting research that we think will establish the evidence-base for OMM/OMT. By no means is the ORC the only place doing good OMM/OMT research. The ORC was placed at the Texas College of Osteopathic Medicine, however, because of the resources supporting our OMM/OMT research, especially the collaboration possibilities with the basic scientists in the Graduate School of Biomedical Sciences.

I personally am working with PhD basic scientists to elucidate the mechanisms of action of the OMT/OMM with regard to immune system function. We think we have been able to prove our lymphatic pump treatment works on rats. We have already proved it works on dogs. Lisa Hodge, PhD and Fred Downey, PhD lead this work with abstracts published in the September *JAOA*. In the animal model we can study a lot more physiology than we can on humans.

The ORC has and is consulting and collaborating with over 20 of the COMs in some way. I am working with two different groups of military researchers in submitting grant proposals to the Department of Defense to test the efficacy of OMT in the treatment of traumatic brain injury. We do not know if these projects are funded, but we have garnered strong support from military medical centers for this work.

The DOs in the military are also one of the bright spots for the Osteopathic medical profession. Given a chance to do OMM/OMT in the field and in the military and veterans clinics, they really shine.

Also on the research front...

We await the publishing of the data from the Multi-center Osteopathic Pneumonia Study in the Elderly (MOPSE) study. Those of us who have seen the results have signed a non-disclosure agreement, so all I can say officially is that the results are "interesting and intriguing." We are hoping to publish the main article in a high-impact journal. We are thinking one of the next steps is to go for an National Institute of Health (NIH) funded multi-site study with a larger number of subjects. We wanted a chance to impact the standard of practice for the treatment of pneumonia.

The MOPSE study was funded by the Osteopathic Heritage Foundation and the Foundation for Osteopathic Health Services. In terms of what is right with the Osteopathic medical profession, these Foundations and the allocation of their resources to fund Osteopathic research and other training programs has been of immense benefit. Recognition and support to these foundations should be given by the Osteopathic medical profession.

I know that the Osteopathic Heritage Foundation has recently made significant research funding grants at A T Still University, Philadelphia College of Osteopathic Medicine and Ohio University-College of Osteopathic Medicine, all of whom are doing significant OMM/OMT research as well as the ORC.

As the evidence-base for OMM/OMT builds up, my hope is that students and practicing doctors will be heartened and confident in developing their OMM/OMT skills. I have seen defining moments begin to occur, in some students, around the discussion of the research. OMT is not just a belief system. It is a scientific reality.

I believe, that eventually, the sheer volume of OMT evidence-base research will have to be recognized by the third party insurance carriers and managed care organizations, and reimbursement for OMT established and increased in some cases. If we are adequately reimbursed for OMT, it is much more likely to be practiced.

Research is not a panacea or the answer to all the challenges facing the osteopathic medical profession, but it sure helps.

The profession has put its money where its mouth is in funding the ORC. Currently the ORC receives vital infrastructure funding from the American Osteopathic Association (AOA), AACOM, and American Osteopathic Foundation as the external funding grants do not provide enough "indirect funding" to support the ORC infrastructure of research coordinators, biostatisticians and other staff support.

There have been indications that this funding may be curtailed. If so, it will seriously jeopardize the progress being made. Other osteopathic colleges want the profession's support as well. It seems that the ORC is constantly faced with the question from the Deans of other colleges, "What have you done for me lately"?

To some degree the ORC is answering this question by producing the needed evidence-based research that supports and benefits the Osteopathic medical profession. There does seem to be a growing capability within the osteopathic medical profession to carry out clinical and basic science research related to OMT. The ORC has been a key catalyst for this progress.

The current sponsors of the ORC need to give high priority to fostering the growth of this research capability by funding other credible research programs along with the ORC.

In regard to funding research, the task of the OMM/OMT research community is to convince the leaders of the osteopathic medical profession to adjust the strategic priorities for the profession and to allocate more resources to evidence-based research on OMM. The American Osteopathic Foundation has contributed \$1,000,000 to the ORC from 2002 to 2009. The ORC and other OMM research centers need much more funding than this to even keep up the present rate of research activity.

Professional Organizations in Osteopathic Medical Profession

The AOA does appear to support OPP/OMM/OMT in its marketing campaigns. I particularly liked, “treating people not symptoms,” and other advertising that refers to OMT.

The AOA must be recognized for the way it protects the good name of Osteopathy and osteopathic medicine by correcting misleading information about Osteopathy and osteopathic medicine that appears on websites around the world.

In my training days of the 1970s and 1980s, I heard the lament about the “lost generation,” and I often wondered if those identified as members of the lost generation thought they were lost. I suspect not.

Historically, I am not as upset about the so-called “lost generation” of DOs that seemed to go “allopathic” in the 1960s, as some of my colleagues. This was the era of the California “amalgamation” but this was also the time when DOs were accepted into the military medical service. This has led to greater acceptance of osteopathic physicians in virtually every area of medical practice.

As one who has lamented the diminished place of traditional osteopathic practice, OMT, in the practices of most DOs, I think that because of the surge of allopathically oriented DOs at that time, perhaps the osteopathic medical profession survived. It preserved the “full scope of medical practice” privileges for those of us who emphasize or practice primarily utilizing OMM/OMT.

A rising tide floats all boats. As osteopathic medicine gained parity with the dominant MD profession in the last 30-35 years, this also carried the OMM/OMT “truth,” and its potential to significantly benefit the level of health in the world, closer to the main stream of health care.

Something else the profession has done for us is advocacy. The AOA, as well as American Academy of Osteopathy, have strongly supported those of us who do OMT on a majority of our patients when the professional liability insurance carriers want to curtail coverage because of concerns over severe adverse events due to cervical manipulation. Not only were AOA representatives sent to discuss and negotiate successfully, but the AOA House of Delegates resolved to study this problem. They commissioned the ORC to do this work. The ORC convened two *focused research forums* on cervical manipulation safety and efficacy. The AOA is now setting up the process to fund research on OMT for cervical spine disorders.

The AOA also seems to be exerting support for Osteopathy and osteopathic medicine on the international scene with the formation of the Osteopathic International Alliance. The Alliance has been a unifying force and has supported the “Training and Practice Guidelines for Osteopathy and Osteopathic Medicine” through the World Health Organization process. These World Health Organization guidelines include definitions of Osteopathy vis a vis osteopathic medicine and Osteopath vis a vis osteopathic physician. This valuable reference document is the start of the clarification process that will be required once OMM/OMT are more fully established through the evidence-base research process.

On the international scene are AOA and college-sponsored medical missions to the third world countries. During the guideline consultations, there were ministers of health from a number

of third world or under-developed countries that were interested in osteopathic medicine.

My belief is that Osteopathy and osteopathic medicine is perfect for these countries that may lack the resources for a lot of the high-tech equipment we are so used to in the United States. These countries do not have a shortage of hands. If they can be trained to do OMT, think of what a benefit this could be to health care, especially when the medicine runs out.

I feel my AOA dues are being well spent and I think we, in the OMM/OMT part of the profession, are well served and should support the AOA. I do believe, however, that a greater percentage of my AOA dues should go for OMM/OMT research.

Another major organization in the Osteopathic medical profession is the American College of Osteopathic Family Physicians (ACOF). I am pleased with the programs of the ACOFP. The ACOFP tests for OMT competence in its board certification process. All currently issued primary certification certificates will read “Certified in Family Practice and Osteopathic Manipulative Treatment.”

This is a strong affirmation of support for OMM/OMT in our profession and should receive more acknowledgment by the profession as a whole.

Manual Medicine at Large

Since I came to the staff of the ORC, I have become acutely aware of the place of Osteopathic medicine on the national scene. At NIH, in general, and at the National Center for Complementary and Alternative (NCCAM) especially, OMM/OMT is seen as part of the arena of “body based therapies,” and we are lumped into the same category as chiropractors, physical therapists, and massage therapists when it comes to competing for research funding. A strategic mistake the Osteopathic medical profession made 15 or so years ago was not to engage NCCAM by having more DO participation on its research panels. When this situation was brought up in leadership circles 15 or so years ago, the response was osteopathic medicine is not complementary or alternative. We are mainstream, and we then lost our seat at the table; a table from which we are just now beginning to get more than crumbs.

I disagree with the view that we are mainstream medicine only. Clearly, osteopathic medicine is both, and we are the perfect bridge between the two schools of thought “allopathic” and “alternative” or “integrative medicine” as I like to call it. As I suggested earlier, the rest of medicine is only now beginning to catch up to Osteopathy and osteopathic medicine.

At this point it is probably useless to argue over terminology; NIH has established manual therapies, of which OMT is considered one such, as “CAM.” There is no dispute that NIH-NCCAM is the major funder, to the tune of millions of dollars for OMM/OMT research. When I am at NIH or participating in NIH related conference calls, it is necessary and usually helpful to use the terms “manual medicine and manual therapy” (MM/MT) instead of OMT. To me, these are not interchangeable terms, but the political necessity at the present time, necessitates talking the language of the majority culture, especially when research funding decisions are in the balance.

I tell the students when I am teaching, they are or will be trained to make life and death decisions. I suggest that a health

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Maximizing Scientific Discoveries in OMM Research

care practitioner, a physician, who has the highest level of training and responsibility brings a whole different “mind-set” and attitude to patient care when the “hands on” work is also applied. I do not worry, therefore, about OMT being diluted or stolen by the other MM/MT professions. In the hands of a physician with the full scope of medical practice license, good hands speak for themselves, loud and clear.

From the perspective of research, the chiropractors and physical therapist have many more DC-PhD or PT-PhDs doing research than there are DO-PhD. We DO researchers are playing “catch-up” and we need all the seed money for preliminary-pilot research that the AOA, AOF, AACOM and foundations can afford.

I do not question the need for support of DOs and DO-PhDs who are doing non-OMT related research. What the osteopathic medical profession has most to offer the world in health care revolves around Andrew Taylor Still’s dream of and vision for the application OPP/OMM/OMT in healthcare.

There is mutually beneficial collaboration possible between the “body based therapies” professions in the research arenas. This is a wholly different arena. It is much different than clinical practice that is governed by state and federal laws.

“Good hands speak for themselves” and whether we DOs like it or not, the other manual medicine and manual therapy professions possess practitioners that do indeed have some very good hands. I think we need to acknowledge this as a profession and make peace.

I acknowledge the existence of cases of non-physician practitioners claiming to do osteopathic treatment or claiming osteopathic training inappropriately according to laws protecting the practice of osteopathic medicine in all of the states. It is our responsibility to work with the AOA in prompting the Attorney Generals of the states to enforce the laws. I oppose the effort within the profession, however, to curtail the activity of osteopathic physicians in teaching “manual techniques” to non-physicians as we are ethically allowed to do. We cannot teach medicine which is OMM and OMT. I know it is somewhat of a semantic-differential issue, but I believe it important for the osteopathic medical profession to be able to interact with other MM/MT professions in every appropriate manner.

What if the Lymphatic Pump Technique is shown to really improve immune system function and prevent disease to a statistically significant degree. Are we going to say only DOs can do it? I believe Osteopathy has something to offer the world. Andrew Taylor Still’s vision and gift, of which we are the stewards, has to be for the world. I believe that as the health benefits of OMM/OMT are established, the whole system of healthcare that is Osteopathic medicine will indeed become the tail that wags the dog and our philosophy and practices will be integrated into all of medicine.

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Since the founding of the ORC, its team of researchers has conducted research demonstrating that:

- 1) One minute of simulated indirect counterstrain can reverse the proliferation of pro-inflammatory cytokines caused by eight hours of repetitive strain in an in vitro fibroblast model that mimics fascia and connective tissue;^{1,2}
- 2) Lymphatic pump technique significantly increases canine lymph flow through the thoracic duct^{3,4,5} and significantly increases immune cell flux approximately eight-fold in the thoracic duct;⁴
- 3) Trained osteopathic physicians can reliably identify the presence of induced canine coronary ischemia solely via palpation of upper thoracic paraspinal tissues. This viscerosomatic interaction is abolished by coronary sympathectomy;⁶
- 4) Systematic review and meta-analysis shows that osteopathic manipulative treatment reduces pain levels in patients with acute, subacute and chronic low back pain;⁷ and
- 5) A randomized controlled trial shows that osteopathic manipulative treatment slows the progression of pain and impairment of back-specific functioning during the third trimester of pregnancy.⁸

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Osteopathic Manipulative Treatment in Pregnancy and Augmentation of Labor: A Case Report

Austin L. Jones and Michael D. Lockwood

Abstract

A 25-year-old primigravid female at 40 weeks and 0 days gestation presented with low back pain and irregular, non-painful, ineffective contractions. Somatic dysfunction was found in the head, cervical, thoracic, sacrum, pelvis, and lower extremity regions. Osteopathic manipulative treatment (OMT) was provided including techniques to address specific articular somatic dysfunctions along with compression of the fourth ventricle (CV4) and sacral rocking. Significant reduction of somatic dysfunction and augmentation of labor was obtained. Fourteen hours after the initial OMT session, a viable male neonate was delivered. Osteopathic obstetrics can be traced to the profession's founder, Andrew Taylor Still. Osteopathic evaluation and management of the obstetric patient can still play a vital role in the modern medical setting. OMT as an adjunctive therapy in the obstetric patient has the potential to provide relief of somatic pain, help maintain homeostasis, as well as support and augment labor and delivery.

Introduction

Obstetrics is an area of medicine that can greatly benefit from osteopathic evaluation and management. Structural, fluid, and hormonal changes associated with pregnancy predispose the patient to discomfort, congestion, and somatic dysfunction. Osteopathic manipulative treatment has the potential to provide: 1) symptomatic relief from somatic pain; 2) assistance in the maintenance of homeostasis through the structural, fluid, and hormonal changes of pregnancy; and 3) support of labor and delivery. The following case study details the osteopathic manipulative management of a 25-year-old primigravid female.

Chief Complaint:

The patient is a 25-year-old white, primigravid female at 40 weeks and zero days gestation presenting with low back pain of two weeks duration and irregular, non-painful contractions of three days duration.

History of Chief Complaint:

The patient describes sharp, low back pain located in the center of her back that is similar to previous back pain experienced intermittently throughout her pregnancy. She rates the pain a four out of ten. The pain has been relieved by osteopathic manipulative treatment (OMT) in the past.

The patient also describes irregular, mostly non-painful contractions that began three days previously. No more than four to five contractions occur per hour. She has presented for cervical examination three times in the past week. She was dilated one cm, 50% effaced, at +1 station one week previously.

Yesterday she was dilated two cm, 75% effaced, and at 0 station. The contractions and her generalized discomfort have caused recent sleep deprivation and she is having difficulty functioning at home and at work. Therefore, induction of labor was been scheduled 40 weeks and two days gestation.

History of Current Pregnancy:

The current pregnancy has followed a relatively uncomplicated course under the prenatal care of a local family physician. Nausea and vomiting of pregnancy was present from six weeks through 24 weeks gestation. Intravenous fluid and electrolyte therapy were not required. Borderline low amniotic fluid indexes reported on third trimester ultrasound, but required no further work-up. Laboratory investigation revealed her to be Group B Strep negative, Hepatitis B negative, and HIV negative. She denies history of sexually transmitted infections and sexually transmitted infections screen was negative. Immunity was confirmed for ordinary childhood illnesses. Patient denies use of alcohol, tobacco or illicit drugs.

Past Medical History:

Prior to pregnancy clinical evaluation and postural series x-ray revealed sacral base unleveling and a T3-T10 convex right scoliotic curve requiring a ½ inch heel lift in the left shoe. There is a history of daily headaches from age 16 years to 20 years relieved by heel lift therapy and OMT. Left knee arthroscopy with medial meniscus repair at age 14 years.

Medications:

Prenatal vitamin. The patient regularly takes prenatal vitamins. She occasionally takes loratadine for seasonal allergies.

Allergies:

A Sulfa allergy with anaphylactic reaction occurred at 12 years of age.

Physical Examination:

Patient is alert, oriented, in no apparent distress and with normal affect.

Vital signs are: blood pressure 115/70, pulse 77 per minute, respirations 16 per minute, height five feet five inches, weight 160 pounds, and basal metabolic index 27.

Patient is pregnant with a term pregnancy. No peripheral edema is present. Fetal heart sounds have appropriate variability and rate 140 beats per minute. Fetal movement is present. Cervix is dilated two cm, 75% effaced, and the fetal head is at 0 station and cephalic in presentation.

Muscle strength is 5/5 in the lower extremities bilaterally. Deep tendon reflexes are +2/4 bilaterally in the lower extremities. Straight leg raise is negative. Increased thoracic kyphosis

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and lumbar lordosis is present. Sub occipital tension is present on the right. C3-5 are extended, side bent left, and rotated left. T7 is flexed, side bent right, and rotated right. T12 is flexed, side bent left, and rotated left. There is a left sacral rotation on a left oblique axis. The right innominate is anteriorly rotated. The left tibia is externally rotated and the left fibular head has posterior-medial glide. The left talus has anterior glide, the left navicular is inverted, and the left cuboid is everted.

Assessment:

1) Pregnancy, term 2) Low back pain 3) Somatic dysfunction of the head, cervical, thoracic, sacrum, pelvis, and lower extremity regions.

Plan:

1) Based upon today's evaluation, osteopathic manipulative treatment was performed in the outpatient setting. Soft tissue techniques, myofascial release, muscle energy, and high velocity-low amplitude techniques were used to correct specific articular somatic dysfunctions. Generalized techniques including rib raising, compression of the fourth ventricle (CV4), and sacral rocking were performed for support of homeostasis and possible augmentation of labor. 2) Treatment was well tolerated without complication. Significant reduction of somatic dysfunction was obtained. Subjective improvement of back pain to a one on a scale of ten was obtained.

Clinical Course:

Following OMT contractions became more regular and intense at approximately 6 contractions per hour. Two hours after initial OMT, follow-up sacral rocking and CV4 were performed, again in the outpatient setting. Contractions continued to become more regular progressing to 8 contractions per hour over the next two hours. At this time the patient was admitted to the obstetrical unit for observation and external fetal heart monitoring.

In the hospital, contractions continued to be more regular, intense, and an average of five to six minutes apart. Contractions continued at this rate and quality over the next ten hours. During this time period the cervix advanced to ten cm dilation and 100% effacement. Throughout this progression no induction agents were provided. Epidural anesthesia was obtained seven hours after admission with the cervix dilated seven cm. The continuous epidural anesthesia infusion provided moderate pain control throughout the duration of labor and delivery. Spontaneous rupture of membranes occurred at the end of cervical dilation. One hour after complete cervical dilation, a viable term male with APGAR scores of nine at both one minute and five minutes was delivered. The delivery was accomplished 14 hours after initial OMT session and 12 hours after follow-up OMT consisting of solely CV4 and sacral rocking.

Discussion

The osteopathic tradition of caring for the pregnant patient can be traced back to the profession's founder, Andrew Taylor Still, MD, DO. Dr. A.T. Still made a number of statements relating to the state of pregnancy, labor, and delivery in his following texts: *The Philosophy of Osteopathy*; *Osteopathy, Research and Practice*; and *The Philosophy and Mechanical Principles of Osteopathy*. Dr. A.T. Still remarked, "An up-to-date osteopath must have a masterful knowledge of anatomy and physiology. He [*sic*] must have brains in osteopathic surgery, osteopathic obstetrics, and osteopathic practice...."¹

Structural, fluid, and hormonal changes associated with pregnancy predispose the patient to discomfort, congestion, and somatic dysfunction. The characteristic changes in the pregnant patient can be divided and described in relation to the traditional trimesters of pregnancy.² Each trimester presents new considerations and challenges in the management of the pregnant patient. A strong contributor to structural changes in the pregnant patient includes compensations associated with an enlarging uterus and forward shifted center of gravity that includes a pelvic tilt, increased lumbar lordosis, and increased thoracic kyphosis.²

Evaluation and treatment of somatic dysfunction can enhance homeostasis, facilitate maternal adaptation to structural changes, and possibly alleviate some discomfort.² Rational treatment of the pregnant patient would include addressing specific somatic dysfunctions with special emphasis on regions associated with relevant autonomic nervous system, lymphatic components, and biomechanical factors. The sympathetic spinal referral region T10 to L2 corresponds with relevant maternal organs. This spinal region is specifically prone to dysfunction as it is also a crossover region that experiences increased strain due to normal changes in anterior-posterior curves. The associated regions relating to the parasympathetic supply to these organs are S2 to S4. For lymphatic considerations, freeing restrictions associated with the transverse diaphragms can potentially help reduce peripheral edema and congestion. The cognizant osteopathic physician would also consider any other regions associated with the common complaints of the normal pregnant patient as they arise. As always, every patient encounter should include careful assessment of maternal and fetal health along with appropriate indications and contraindications for treatment.² With careful consideration of relevant anatomy, physiology, and pathology of the pregnant patient, the osteopathic physician is able to provide competent and compassionate, value-added care for the obstetrical patient.

There is evidence that OMT in the prenatal period improves outcomes for both mother and baby.³ Although OMT is rarely used in labor and delivery, it can be useful in some situations. With increased morbidity and mortality associated with post-term pregnancies, a non-invasive, non-medicinal alternative seems warranted.⁴ Careful consideration of the functional anatomy and physiology of the pregnant patient suggests that OMT could be used to enhance or augment labor, especially with an emphasis on the autonomic referral areas that contribute to uterine contractility. There are also reports that cranial manipulation, including CV4, can provoke uterine contractility and has been used to overcome uterine inertia (atony) on a number of occasions.^{5,6}

Compression of the Fourth Ventricle

Most osteopathic physicians are familiar with the compression of the fourth ventricle as this technique is listed in foundational textbooks including the *Foundations for Osteopathic Medicine* and various books of cranial osteopathy.^{5,7} The technique is also included in the National Board of Osteopathic Medical Examiners testing items as well as the American Osteopathic Association and American Academy of Osteopathy's specialty examinations. The general thought is that there are systemic effects of the CV4 technique with the mechanisms attributed primarily to stimulation of nuclei and brain centers at the fourth ventricle. These centers

include viscerosensory and visceromotor functions influencing physiologic phenomena such as vomiting, coughing, swallowing, heart rate, respiratory rate, levels of consciousness, and febrile manifestation. Some of the physiologic effects attributed to the CV4 technique include facilitation of edema resolution, generalized relaxation, and alterations in autonomic tone.⁸

The CV4 has a history of scientific inquiry. In the 1960's and 1970's application of the CV4 technique led to documented alterations in skin resistance, changes in random blood sugar, and changes in white blood cell counts.⁵ More recent studies using the occipital CV4 technique have documented changes in the Traube-Hering-Mayer (THM) oscillations, sleep latency, and sympathetic nervous system activity.^{9,10,11} Surgueef, Nelson, and Glonek used a non-invasive transcutaneous laser Doppler flow meter and showed effects in alterations of autonomic tone as a result of the occipital fourth ventricle compression. The Traube-Hering component alteration was felt to be the result of a baroreceptive oscillation and a general measure of intrinsic tone of the autonomic nervous system.⁹ In 2005, Cutler, Holland, Stupski, Gamber, and Smith discussed the changes in sleep latency and sympathetic nervous system activity using microneurography and electroencephalography to confirm alterations during application of the CV4 technique.¹¹ Interestingly, investigators outside of the osteopathic profession have investigated the use of the CV4 technique. In 1999, Hanten et al. documented a decrease in headache pain with CV4 techniques performed by physical therapists for patients with tension-type headache.¹² It was noticed that there was a significant improvement in both intensity and affect scores of the individuals that received the occipital CV4 treatment as compared with a no treatment group and a group solely placed in a position of comfort.¹² There is currently an ongoing study examining use of the CV4 in pregnancy at the research institute at the Texas College of Osteopathic Medicine.⁸

Overall, there is a preliminary evidence based medicine component to the use of the CV4 technique in clinical medicine, at this time categorized as a Grade C. However, with the promising studies and unanswered questions including the mechanism of action, dose, duration, and use with other procedures, the CV4 technique is interesting to ponder. The anecdotal reports involving use of the CV4 technique in the late stages of pregnancy along with the ongoing investigation of its use in this clinical setting suggests that this technique has a strong potential for regular use in obstetric practice. Outside of the discipline of obstetrics, there are also anticipated studies involving the CV4 technique for patients with migraine headache, congestive heart failure, hypertension, and insomnia.⁸

Summary

In this case study, the use of OMT provided a significant reduction in the patient's initial complaint of back pain. The patient was also a candidate to receive empiric osteopathic manipulative techniques aimed at augmentation of her early stage of labor associated with minimally effective, unorganized contractions. The patient experienced acceleration in contractions and an advancement in labor following OMT. This case study provides an excellent example of the opportunity that physicians have to provide competent, compassionate, and value-added care for the obstetrical patient through the integration of OMT into their care.

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Migraine and OMT

Krystal Batchelor and Russell Gamber

Introduction

Migraine is the well-known phenomenon that plagues 10 to 15 percent of the population. This debilitating type of cephalgia is characterized by many neurological symptoms including severe focal head and neck pain, nausea and vomiting, photophobia, phonophobia, visual auras, and temporary loss of vision. Migraine has also been known to cause hemiparesis and dysphasia in patients.¹ Migraines usually occur between the ages of 15 and 55, and 70%-80% of sufferers have a significant family history of migraine.² Over the years, a continuous search for the cause and pathophysiology of the migraine has been conducted. In early research, it was believed that an incident could be brought on solely by an intracranial vasoconstriction of vessels followed swiftly by a compensatory vasodilation. Studies at that time, provided evidence for what seemed to show that the vasoconstriction caused the visual aura that occurs in some patients, and the vasodilation provoked the actual head pain. This vasogenic theory has recently been demoted from primary cause due to the emergence of the neurogenic theory, which includes a different school of thought. It is now widely accepted that the migraine is not a result of vascular irregularity alone, yet a consequence of the brain itself activating and sensitizing the trigeminal nerve fibers within the meninges.³ These irritated nerve fibers are thought to then release chemicals that further add to the process by causing the blood vessels to swell on the surface of the brain. These swollen blood vessels then send pain signals to the brainstem which is an area of the brain that deals with nociceptive information.²

The neurogenic explanation of migraine has been illustrated in patients who not only experience the excruciating cephalgia, but also suffer with the visual aura. In these patients, who make up approximately one-third of the migraine population, a scotoma or visual light phenomenon occurs anywhere from 20 minutes to one hour before pain begins. These auras have been described many times as “flashes of light, stars, zigzags, or blind spots”. This dysfunction is thought to be brought on by a change in cortical neural function now known as cortical spreading depression.¹ This neurophysiologic event which includes a slowly propagating wave of neuronal depolarization that travels across the cortex with a speed of 3-5 mm/minute⁴, is thought to further trigger the release of neurotransmitters and nociceptive substances into the interstitial space from the cortex. The build-up of these substances leads to the activation and sensitization of the trigeminal nerve fibers³. Once the nerve fibers are irritated, the migraine and all of its associated pain follow quickly.

Case History

JG is a 58-year-old caucasian female who presented to the osteopathic manipulative treatment clinic with a chief complaint of cervical pain and tenderness, and recurring migraine headache. JG reported that she has experienced migraine headaches since the age of twenty-four and has associated visual aura of flashing lights that precedes the headache by 30 minutes. She also reports nausea and vomiting with each incident. JG reports trying multiple prescription medications for migraines, including sumatriptan, but failed to receive any relief. Thirty-five years ago, the patient had a hysterectomy to prevent hormonal stimulation of the Migraine headaches. Since her headaches have returned, her work at a church daycare has been hindered. Her migraines now occur everyday and vary in severity. She reports that her headaches occur mostly in the latter part of the day. They are triggered by stress, fluorescent lighting, and lack of sleep.

JG described her past medical history as including diagnoses of anxiety controlled by Xanax, gastro esophageal reflux disease treated with Protonix, Type 2 Diabetes Mellitus controlled with Ameril, allergies treated with Zyrtec, and major depression managed by psychiatric care and Prozac. In addition to the hysterectomy and two rotator cuff surgeries, she has also had her gallbladder and appendix removed. The patient further mentioned a whiplash injury from five years ago due to a Motor Vehicle Accident.

The patient denied use of alcohol and tobacco. She is allergic to Darvocet. Her mother has hypertension, congestive heart failure and type 2 Diabetes Mellitus. Her father has type 2 Diabetes Mellitus. Upon initial examination, her blood pressure was 122/74, pulse was 80 beats per minute, and respiration was 20 per minute. Her pain was 4 out of 10 mostly in the neck area. She was not suffering from migraine pain at the time of examination. Significant tissue texture changes in the right C4-C5 area of the neck were noted. Segments C3-C5 were rotated right and sidebent right. She also had multiple cervical tender points. The most painful tender point was immediately inferior and midline to the occipital condyles. The patient's first rib on the right was elevated and painful. She also had decreased sacral motion, thoracic tissue texture changes, and a segmental diagnosis of T6-T12 rotated left, sidebent right. Her left shoulder, which had two surgeries, had multiple tender points and tissue texture changes. The patient's cranial rhythm was restricted at the left temporal bone.

Review of Literature

As common as the migraine headache might seem today, a dependable, successful treatment model continues to remain an enigma. According to Weintraub in "Treatment of Acute Migraine Attacks," the previous statement remains true due to the fact that migraine is a heterogeneous disorder.⁵ Each treatment protocol must undeniably be personalized for each patient. Some patients may benefit from prescribed medication, while others may only benefit from manipulative therapy or a combination thereof. As Osteopaths, it is not only a duty to be knowledgeable on how to prescribe for the patients who need medications, but also to be able to understand and perform osteopathic manipulation for the migraine victims when necessary.

One osteopathic article discussed the treatment of migraine with craniosacral technique. This paper, written by E. F. Bernhardt, D.O., talks about the different areas of the cranium which are pertinent in migraine headaches.⁶ Dr. Bernhardt mentions the occipito-atlantal joint, occipital condyles, occipito-mastoid joint, and the sphenobasilar synchondrosis as areas of importance in patients with a migraine. He describes how to actually treat each area. He recommends relieving somatic dysfunction of the skull using the indirect method described by W. G. Sutherland. "One must take the articulation to the restrictive barrier and then allow it to "float" away from that barrier to a neutral or "easy normal" point." Bernhardt offers the observation that most migraine patients present with "the sphenoid rotated on its anteroposterior axis with the greater wing more prominent (lower) on the side of pain." It is in this position that the major contributory bodies, the temporal bone, occiput, and vasculature are aligned to produce an environment conducive for the headache. This article is significant in the way Bernhardt offers his personal advice and experience on the use of osteopathic treatment for migraine. He speaks of the positive effects of these techniques in alleviating pain. A chiropractic paper was written about the results of spinal manipulation treatment on migraineurs selected from the public.⁷ In this form of spinal treatment, a passive manual maneuver was performed in which the three joint complex of a cervical segment was carried beyond the normal physiologic range of movement and then followed up with a short amplitude, high velocity, spinal manipulative thrust. This treatment was given for two months. The cervicals in this study were the area of interest due to the common relationship of migraine and cervicgia. This study had approximately 127 migraine patients who either received the control treatment or the protocol listed above. The results of this study showed statistically significant improvement in migraine frequency, duration, disability, and medication use, when compared to the control group.

Lastly, a study was designed by Parker, Tupling, and Pryor in order to test cervical manipulation and its effects on migraine.⁸ In this controlled trial, three different types of physical cervical treatment were compared. One group of patients received cervical manipulation, including high velocity, low amplitude techniques by a trained physician; another received cervical treatment from a chiropractor, and the control group was treated with cervical mobilization by a trained physician. The results of this study considered all treatment modalities together and showed significant post-treatment improvement in headache frequency,

severity, and disability, but not in duration. Post-treatment results were compared to pre-treatment evaluations. Comparisons between the chiropractic manipulation and the control cervical mobilization showed no significant difference.

Treatment and Discussion

JG's manipulative treatment began with the application of soft tissue kneading and massage to the areas of most severe pain and restriction. The cervical, thoracic, lumbar, sacrum, pelvis, and upper extremity tender points were treated with Jones Strain Counterstrain or myofascial release. Cranial treatment was applied to the left temporal. Her elevated right first rib was addressed with a muscle energy technique that included a respiratory force component. The patient was further counseled on the importance of stretching and exercise. The patient was also instructed on how to self-treat her tender points on a regular basis.

Due to the tremendous burden one must deal with when experiencing a migraine, it becomes important to treat with a holistic approach. The patient must be further counseled on how to recognize and avoid migraine triggers. Some of the more common triggers are perfume, cigarette smoke, stress, alcohol, foods, too much sun, too much or too little sleep, hormones, menstruation, and medications.⁹ Moreover, Breslau et al discovered that the lifetime prevalence of major depression is approximately three times higher in persons with migraine compared with controls.¹⁰ This study alone should stimulate Osteopaths to discuss mental wellness and consider the possibility of prescribing an anti-depressant, if needed.

Along with the prescriptive and non-prescriptive medications, manipulative treatments, and psychological assessments, research also provides support for treating with biofeedback, self-hypnosis, acupuncture, and herbal remedies. As evidenced, migraineurs have a vast array of treatment options.

JG expressed immediate improvement following the OMT treatment. She reported that her neck region was unusually relaxed and free of pain. She was advised to return for a follow-up visit in one week.

Conclusion

In the future, migraine research will advance and grow, and as this occurs, it will become essential to adopt new treatment methods while perfecting the old. Until the perfect "cure-all" is found, migraine will remain a demanding and challenging syndrome that all physicians must learn to diagnose and treat. Many modalities and treatment options are currently utilized successfully, including osteopathic manipulation. Osteopathic physicians practicing OMT on migraine patients should view this as an advantage and unique opportunity to improve migraine patients' quality of life and overall health.

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BOOK REVIEWS

David Essig-Beatty, Reviewer



Fire On The Prairie: The Life And Times Of Andrew Taylor Still, Founder Of Osteopathic Medicine, Zachary Comeaux, Published by Booklocker.com 2008. Pgs. 264 in paperback; Copyright 2008. ISBN-10 1601453612 and ISBN-13 978-1601453617. Available at www.amazon.com; \$19.95

The new historical novel *Fire on the Prairie* by Zachary Comeaux has a way of cutting straight to the heart of osteopathic medicine in America. The story follows the aging founder of the profession through its seminal years in Kirksville, Missouri at the turn of the nineteenth century. Andrew Taylor Still's patient encounters trigger reminiscences of childhood in Virginia, young adulthood in Kansas during the Civil War, and personal tragedy on the Kansas prairie. Each event was a major influence on his evolving Philosophy of Osteopathy. During student encounters the old doctor reveals practical applications of that philosophy for patient care with a gentle prodding and wry humor that all teachers will take to heart. Meetings with professors at the American School of Osteopathy reveal the struggle to unify and legitimize the profession in its crucial early days. Dr. Nettie Bolles, for example, the first female graduate and anatomy professor, reassures Still about the loss of osteopathic uniqueness with "We prairie folk have learned that truth prevails. I have heard you say 'Give me the age of God and I will give you the age of Osteopathy'... We will make it work out regardless of the circumstances with your men in fancy cuffs and coats." Dialogue throughout the book is peppered with similar quotes from published works and archival documents.

Like Dr. Still starting a new medical profession, Comeaux has walked the walk to arrive at this unique publication. He came to osteopathic medicine after a spiritual crisis, dissatisfaction with a divinity and social work career. He has treated miles and miles of necks as well as other parts to arrive at a level of healing potential few American DOs now attain. He has sat on a rock ledge over a creek in Jonesville, Virginia, watched the Kansas prairie along the Wakarusa River, walked the railroad tracks in Kirksville, and has seen one more patient before calling it a good day. He spends some of nearly every day teaching osteopathic philosophy and manipulative treatment with passion and conviction.

Like early osteopathic medicine, the book is a little rough around the edges. First printing misspellings and tense disjunctions soon fade as the reader encounters surprising but accurate historical events. There is the arrival and departure of Scottish scholar John Martin Littlejohn and the subsequent birth of both the Chicago College of Osteopathic Medicine and British Osteopathy. There's a dramatic court appearance by Mark Twain, a staunch if sarcastic osteopathic advocate. There is the behind the scenes spiritualism and inspiration of the lovely nurse Sally Taylor. The book climaxes after AT Still's death in 1918 with the profession balanced on the blade of a surgeon's knife. Can Osteopathy muster its own self-healing capabilities to heal its wounds? This wonderful little book will encourage DOs and others to dig on to find the answer. □

Robert C. Clark, Reviewer



Biodynamic Craniosacral Therapy, Volume one, by Michael J. Shea, PhD, Published by North Atlantic Book, Berkeley, California. ISBN: 978-155643-591-1 Available at www.amazon.com; \$19.95

This is a large book of over 500 pages including the references. It took quite a while to read this book as it is very detailed and there is a lot of information.

Body, mind and spirit are three element of each individual. Medicine routinely addresses the first element and to a lesser degree the second. The author contends that Sutherland started to address the spirit component and Biodynamic Craniosacral Therapy expands upon the work that Sutherland started.

Attitudes of respect and reverence are recurrent themes as are the need for the practitioner to be calm in mind and to be still and know. Dr Shea shares his methods of approaching the treatment of babies. He notes that too many clinicians approach infants too aggressively.

Overall the book is interesting to read and is well written. Some elements seem extraneous, such as chapters that are interviews with practitioners or referenced authors. In some chapters the author carefully defines terms, but in other chapters he seems oblivious to the fact that a reader unfamiliar with the biodynamic model will not understand the text. There is, unfortunately, a glossary at the end of the book to remedy this deficit. It should be referenced throughout the text.

Journal Review

Robert C. Clark, Reviewer

Manual Therapy, Elsevier, Customer Service Department, 6277 Sea Harbor Drive, Orland, FL 32887

Two issues were reviewed: Volume 12, numbers three and four, August and November 2007. Each issue was over 100 pages. The content was primarily research on manual therapy topics. Few were clinically relevant to the reviewer who is a clinician. Readers who work in biomechanical research would find the journal valuable. The authors are from around the world and present a wide range of topics. Writing quality is variable as the publisher assumes that all submissions are fully edited and prepared for publication. This makes some articles harder to read and comprehend than others. Some of the articles discussed specific treatments or motion tests but did not illustrate them while others did. Those that did illustrate the techniques discussed, better enabled the reader to “get the picture.” Another point of difficulty was the technical terminology used by authors from different countries. For example: What is a “grade two down slope mobilization of C5/6 and C6/7? Illustrations would have given the reader more understanding of the technique being discussed. □

Have you read a book or watched a video that you think is valuable to your colleagues? If so write a review for the *AAOJ*. Send it to the editor by e-mail to editoraaoj@yahoo.com or by mail to Robert C. Clark D.O., 3243 Clayton Road, Concord, CA 94519. Please submit your review in a Microsoft Word ® document whether by e-mail or in disc formats.

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□



Medscape Today Medpulse(R) (online) January 22, 2008

Is Fibromyalgia a medically recognizable disease? Readers were asked this question in an informal survey. Of 3585 respondents, 60% said yes, 27% said no and 11% were unsure. This survey was a follow-up to the June 2007 announcement of United States Food and Drug Administration's approval of expanding the indications of pregabalin (*Lyrica*, Pfizer) to include the treatment of Fibromyalgia. Previously, the drugs approved indications were for the treatment of partial seizures, post herpetic pain and pain from diabetic neuropathy.

Baumol's Disease, Author Bobby J. Newhall, MD, explores this unique disease that has significant impact on all medical practices. In actuality, it is not a medical disease but an economic phenomenon. Economist, William Baumol, observed that attempts to control medical costs via technology and/or management tools such as HMO or large group practices has little impact on cost. He noted that one physician could only see one patient at a time. Each procedure that the physician performs takes roughly the same amount of time. The unpleasant fact is that rising health care costs may be, in the words of Baumol himself, "an inevitable and ineradicable part of a developed economy. The attempt to do anything about it may be as foolhardy as it is impossible." Dr. Newhall concludes that the practice of medicine is a human art and not merely a business or industrial process.

Managing the physician's front office by Robert I. Freedman, Esq., explores the difference between a well-run office and one that is not. He observes that the patient's first impression of a practice occurs in the reception and waiting area. He argues that patients should not have to wait a significant amount of time to see the doctor. Bad service is equated to bad management. Mr. Freedman interviewed his dentist to give an example of good patient service before seeing the doctor. In conclusion, people do not like poor service in a restaurant or a store or a doctor's office. Mr. Freedman feels they should not have to endure poor treatment.

Artificial Disc Versus Fusion: A Prospective, Randomized Study With 2-Year Follow-up on 99 Patients by Rick C. Sasso, MD and colleagues compared patients who received the Bryan artificial disc replacement with anterior cervical fusion with allograft and plate. The Bryan artificial disc replacement compares favorably to anterior cervical discectomy and fusion for the treatment of patients with 1-level cervical disc disease.

From Manual Medicine, Volume 12, Number 3

The diagnostic validity of cervical flexion-rotation test in C1/2 related cervicogenic headache by Mark Ogince, et al, tested the specificity and sensitivity of this method of motion testing in patients with cervicogenic headaches. They concluded the test was at least 90% accurate.

Improved contraction of the transversus abdominis immediately following spinal manipulation: A case study using real time ultrasound imaging by Norman W. Gill and associates concluded that spinal manipulation improved muscle function in the study muscle group.

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Normalization of Muscle Function by Jay B. Danto, DO, ABHM, C-SPOMM

From the Introduction:

... I want to proudly announce that it is a “techniques” book. Some of my colleagues frown on teaching techniques, but “techniques” have historically been the building blocks of any kind of treatment or healing practice. There is no one technique that I have found to be a panacea and consequently, that is why I present many different “techniques”. “Techniques in medicine are the paths upon which a physician can travel upon to discover the many facets that create a picture of the human body.”

In the first chapter, I have summarized the basic treatment techniques and their history in practice. This book is not intended to completely replace other references that focus on an individual technique, but it is intended to be a practical reference for physicians both experienced and new to holistic medical treatment of the musculoskeletal system.

This book combined with the companion guidebook and CD provide the physician with a powerful set of tools. When a patient with pain complaints presents in your practice, you can have them go through the guidebook to try and find the pain referral drawings that most closely resemble what they are experiencing.

Jay B. Danto, DO

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