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The American Academy of Osteopathy is your voice...

in teaching, promoting, and researching the science, art, and philosophy of osteopathic medicine, with the goal of integrating osteopathic principles and osteopathic manipulative treatment in patient care.

If you are not already a member of the American Academy of Osteopathy (AAO), the AAO Membership Committee invites you to join the Academy as a 2018-19 member. The AAO is your professional organization. It fosters the core principles that led you to become a doctor of osteopathic medicine.

For $5.54 a week (less than the price of a large specialty coffee at your favorite coffee shop) or just 79 cents a day (less than the cost of a bottle of water), you can become a member of the professional specialty organization dedicated to you and osteopathic manipulative medicine (OMM).

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• networking opportunities with peers.
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• complimentary subscription to The AAO Journal, published electronically 4 times annually.
• complimentary subscription to the online AAO Member News, published 8 times annually.
• weekly OsteoBlast e-newsletters, featuring research on manual medicine from peer-reviewed journals around the world.
• practice promotion materials, such as the AAO-supported “American Health Front!” segment on OMM.
• discounts on advertising in AAO publications and in materials for the AAO’s Convocation.
• the fellow designation of FAAO, which recognizes DOs for promoting OMM through teaching, writing, and professional service and which is the only earned fellowship in the osteopathic medical profession.
• promotion and grant support of research on the efficacy of OMM.
• support for the future of the profession through the Student American Academy of Osteopathy, the National Undergraduate Fellows Association, and the Resident American Academy of Osteopathy.

If you have any questions regarding membership or membership renewal, contact Bev Searcy, the AAO’s finance and membership assistant, at BSearcy@academyofosteopathy.org or at (317) 879-1881, ext. 212.

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AAOJ Call for Submissions

Time is precious and article writing is often triaged for busy physicians. In an effort to help guide the journal and stimulate interest in academic and scholarly activity, we are providing some broad topics that can be “reserved” for you. These are by no means the only topics for the journal, but it helps to eliminate the writer’s block that so many of us may face.

Below are the topics available to reserve if you would like to support your portfolio with academic writing:

• Osteopathic approaches to treating patients with pelvic dysfunctions
• Osteopathic approaches for the cardiac patient
• The body triune: osteopathic treatment of mind and spirit for today’s patient
• Beyond Spencer technique: OMT for shoulder overuse
• Using OMT to treat patients with long-term side effects of radiation for cancer treatment

If you have interest in any of these topics, send an email to Lauren Good and reserve your topic today. Manuscripts should be emailed to editoraaoj@gmail.com within three months of reserving a topic. See the AAOJ’s Instructions for Contributors for more information on submitting manuscripts.

In addition, we are asking for peer reviewers to assist us in producing the best journals we can, so please contact AAO Communications Specialist Lauren Good at LGood@academyofosteopathy.org if you can help in this capacity. No experience is required, and training resources will be provided. Peer reviewers are expected to review at least two manuscripts per year.

If you have any questions, please email us at editoraaoj@gmail.com.
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AAOJ Submission Checklist

Manuscript Submission
- Submission emailed to editoraaoj@gmail.com or mailed on a flash drive or CD to the AAOJ managing editor, American Academy of Osteopathy, 3500 DePauw Blvd, Suite 1100, Indianapolis, IN 46268-1136
- Manuscript formatted in Microsoft Word for Windows (.doc, .docx), text document format (.txt), or rich text format (.rtf)

Manuscript Components
- Cover letter addressed to the AAOJ’s editor-in-chief with any special requests (eg, rapid review) noted and justified
- Title page, including the authors’ full names, financial and other affiliations, and disclosure of financial support related to the original research or other scholarly endeavor described in the manuscript
- “Abstract” (see “Abstract” section in “AAOJ Instructions for Contributors” for additional information)
- “Methods” section
  - the name of the public registry in which the trial is listed, if applicable
  - ethical standards, therapeutic agents or devices, and statistical methods defined
- Four multiple-choice questions for the continuing medical education quiz and brief discussions of the correct answers
- Editorial conventions adhered to
  - terms related to osteopathic medicine used in accordance with the Glossary of Osteopathic Terminology
  - units of measure given with all laboratory values
  - on first mention, all abbreviations other than measurements placed in parentheses after the full names of the terms, as in “American Academy of Osteopathy (AAO)”
- Numbered references, tables, and figures cited sequentially in the text
  - journal articles and other material cited in the “References” section follow the guidelines described in the most current edition of the AMA Manual of Style: A Guide for Authors and Editors
  - references include direct, open-access URLs to posted, full-text versions of the documents, preferably to digital object identifiers (DOIs) or to the original sources
  - photocopies provided for referenced documents not accessible through URLs
- “Acknowledgments” section with a concise, comprehensive list of the contributions made by individuals who do not merit authorship credit, as well as permission from each individual to be named
- For manuscripts based on survey data, a copy of the original validated survey and cover letter

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- For named sources of unpublished data and individuals listed in the “Acknowledgments” section, written permission to publish their names in the AAOJ
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Financial Disclosure and Conflict of Interest
Authors are required to disclose all financial and nonfinancial relationships related to the submission’s subject matter. All disclosures should be included in the manuscript’s title page. See the “Title Page” section of “AAOJ Instructions to Contributors” for examples of relationships and affiliations that must be disclosed. Those authors who have no financial or other relationships to disclose must indicate that on the manuscript’s title page (eg, “Dr Jones has no conflict of interest or financial disclosure relevant to the topic of the submitted manuscript”).

Publication in the JAOA
Please include permission to forward the manuscript to The Journal of the American Osteopathic Association if the AAOJ’s editor-in-chief determines that the manuscript would likely benefit osteopathic medicine more if the JAOA agreed to publish it.

Questions? Contact editoraaoj@gmail.com.
Perception is everything, I was once told. Throughout history, perception is viewed from the perspective of the dominant group, whoever that dominant group may be. The perception that the dominant group is providing equity is also a trait seen in the dominant group. A perfect example of this is seen in history books surrounding conflict. A history book in Japan looks very different from a history book in the United States when it comes to the bombing of Pearl Harbor.

Whether it be racial injustice, gender inequality or divisions of class or creed, there is too much “us versus them” happening in the world today. When we see injustices, it makes us all the more irate. We want retribution, fairness, and equity to happen now. Passions run high but often in the absence of reason. We do things without forethought, often to the detriment of those we are trying to protect the most.

In this issue of *The AAO Journal*, a deep-seated issue is finally emerging around National Institutes of Health funding. While we can speculate about the reasons and ultimately get angry about it, the most corrective course of action is to move towards a solution which is equitable to the non-dominant group: us. Dwelling on the inequity has little benefit if not done in the spirit of finding a corrective path. I am hopeful that this issue of the *AAOJ* does more than stir up discontent among the readership, but rather, focuses readers on the solution moving forward.

There was a time when this profession was seen as “other than.” Nettie Bolles, the first female osteopathic physician, was not allowed to practice medicine at the time she graduated, so she focused on hygiene and sanitation while teaching. Globally, 370 million indigenous people have been dispossessed of their lands, making them some of the most disadvantaged people in the world. Battles in third-world countries for religious rights are at the forefront of much of the news, with incarceration simply on the grounds of religion and belief being a global issue. These issues in the news and history represent groups of “others” who were treated with disregard due to belief, gender, or race. The dominant group, authority, religion, or sex, at some point decided what was acceptable in all these cases. These moments in history became crossroads for change. The most productive of these movements focused on the solution, not the problem.

Though legal battles have been fought and won, this profession is still viewed as a minority. It is the collective history that defines us all, and while we can suppose how this history came about, ultimately it is our history moving forward that matters the most.

We need to be the change agents for the next generation. *How* we do this is just as important as *what* we do. While there is a place for anger, it is not here. The profession needs to find the proverbial “seat at the table.” As osteopathic physicians, we must value academic and scholarly activity in order to find that seat. We must find common ground, but not lose ourselves or our distinctiveness in the process.

What can you do to be that change agent? Become educated in scholarly activity, research, and grants through the Scholar 7 and Scholar 4 series found on the AAO’s website. Have a voice at the table and make it heard through contacting your local and state organizations and the American Osteopathic Association. Support research through organizations such as the Foundation for Osteopathic Research and Continuous Education. Become a mentor to the next generation of upcoming students. Get involved in the NIH and begin promoting the osteopathic terminology and database that will get us on the scholarly map. Most importantly, *do something* that promotes the profession. This can be our crossroads for change, a key to promoting and securing research for the osteopathic profession for generations to come.

**Reference**

AAO Calendar of Events

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

2018

June 20  Committee on Fellowship in the AAO’s teleconference—8 p.m. Eastern

July 4  Independence Day—AAO office closed

July 14-15  AAO Board of Trustees’ meeting—The Pyramids in Indianapolis

Aug. 3-4  AAO Education Committee’s meeting—The Pyramids in Indianapolis

Aug. 10-12  “High-Velocity, Low-Amplitude Technique”—Michael L. Kuchera, DO, FAAO, FNOME, course director—The Pyramids in Indianapolis

Aug. 22  Committee on Fellowship in the AAO’s teleconference—8 p.m. Eastern

Sept. 3  Labor Day—AAO office closed

Sept. 14-16  “That’s the Point! Multifaceted Clinical Approaches to Viscerosomatic Reflexes”—Michael L. Kuchera, DO, FAAO, FNOME, and William H. Devine, DO—Midwestern University/Arizona College of Osteopathic Medicine in Glendale

Oct. 6-8  AAO at OMED: “Respectful and Mindful Use of Our Hands Across the Osteopathic Disciplines”—Robert N. Agnello, DO, FACOFP, program chair—San Diego Convention Center

Oct. 20  Committee on Fellowship in the AAO’s meeting and examinations—The Pyramids in Indianapolis

Nov. 9-11  “Fascial Approach to the Thoracic Viscera: A Basic Course”—Richard G. Schuster, DO, course director—Rowan University School of Osteopathic Medicine in Stratford, New Jersey

Nov. 22-23  Thanksgiving holiday—AAO office closed

Nov. 30-Dec. 2  “Introduction to the Fascial Distortion Model”—Todd A. Capistrant, DO, MHA, course director—AAO office

Dec. 7-9  “The Arteries of the Abdomen and Pelvis”—Kenneth J. Lossing, DO, course director—UNTHSC Texas College of Osteopathic Medicine in Fort Worth

OMED 18

come together

friday, october 5—tuesday, october 9
san diego
Book Review—Living Long and Loving It: Achieving a Healthy and Active Lifestyle by Irvin M. Korr, PhD, and Rene J. McGovern, PhD

Thomas R. Byrnes Jr., DO

I was a second-year student at the Kirksville College of Osteopathic Medicine (KCOM). Dr. Irvin Korr was on a visiting educator list that student groups could request come speak about what was most important that they pass on to us as future physicians. He was 79 at the time. My classmates and I were surprised to watch him spring up the stairs and onto the stage with a fluidity of gait you might expect of a man half his age. Sharp and funny, he regaled us for over an hour about his life journey and lessons learned, past and ongoing.

Written by a world-class scientist in plain English with minimal scientific jargon, this book is an expansion of that talk. He told his story of a transition from a 30-something hypochondriac with a pessimistic, frenetic, rather unhappy way of dealing with life and those around him. So sure was he of dying an early, miserable death that he over insured his life to that expectation and easily outlived the limited liability coverage of his policies! However, by that time he was happy to do so, because with the help of his colleagues at KCOM, he had realigned his mind, body, and spirit, learning to enjoy himself, his increased vitality, physical activity, and many endeavors, as well as the company of those around him for almost a half century longer than his earlier life expectation.

Dr. Korr, by age 90, finished the manuscript of his life journey full of simple wisdom, but was stymied by the editor's requests for additional edits and chapter rearrangements before publishing it. The final manuscript and editors notes were left to the A.T. Still Osteopathic Museum upon Dr. Korr's death. Dr. Rene McGovern, in a labor of love, took the nearly finished manuscript and, using Dr. Korr's articles and writings, made the edits to complete the final version of the book in his own words.

This book was originally published in limited numbers for a small audience in 2008, but it is still vibrantly current. Last October, my first visit to Kirksville since 1992, I was thrilled to buy the last printed copy available from the museum. Reading it, I found a treasure beyond price. It’s been said, “we all get interested in geriatrics eventually.” If you find yourself seeking advice about living a long, enjoyable, productive life, doesn’t it just make sense to get that advice from someone who has experienced the very thing? This is the beauty, essence, and value of Dr. Korr’s book. You hear from a man without an agenda or plan to profit from any benefit you derive by the reading. He simply shares his “secrets” of success:

This book is intended as an affirmation that the last part of one’s life can indeed be the best part. The opportunity is open to each of us to 'make it so' [emphasis added]…Once we understand what is meant by healthy living, it is never too early or too late to start along the path to better health…. it is written for those, regardless of age, who are motivated to achieve levels of health that will enable them to enjoy a long and active life. I hope that it will also influence some who, by virtue of their roles in society, have the responsibility and the power to support such efforts and to remove economic, educational and environmental obstacles.1

The ideas in this book are important to all of us and will prove useful on multiple levels. On a personal level, I am reminded how and why I was guided in my life to become an osteopathic physician. On the next level, I am purchasing multiple copies to share with my family, friends, and patients so they may gain a fuller appreciation of why I practice as a physician in this way. I want to give them the opportunity to read and contemplate Dr. Korr’s words and to choose for themselves how much or how little they wish to avail themselves of this beautiful approach to life.

At another level, it can help the leadership and staff of the American Osteopathic Association as it seems to be in the process of rediscovering itself and rededicating to its original mission. It can be useful to the AOA component societies as they navigate the process of integrating themselves into the Single Accreditation

Financial disclosures: none reported.
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Submitted for publication April 12, 2018; final revision received May 15, 2018; manuscript accepted for publication May 23, 2018.
Dr. Korr’s core concepts lead toward a different pathway, another paradigm. When (if?) implemented by a critical mass of U.S. citizens, this new paradigm will markedly decrease reliance on heavily marketed, ever more expensive and marginally effective, marginally safe drugs and technology. There will be enough people with what he recognized and describes in the book as “an effective and efficient internal HMO” (health maintenance organization).

With the enhanced health that is known to accompany self-awareness, good health practices, and an internal sense of control, the current marketing-driven, suffocating demand for frighteningly awareness, good health practices, and an internal sense of control, the current marketing-driven, suffocating demand for frighteningly expensive new drugs and technology will drop, resulting in more equitable price points when these do reach the market.

The US is currently careening headlong into a crisis with its health care system. It is conceivable that most of the population will soon be working to purchase food, procure housing, pay taxes, and finance their health insurance (premiums, deductibles, co-pays, co-insurances, etc., etc., etc.), and they will make only enough money to afford 3 of the 4 of these necessary expenditures. Good for those collecting the money, bad to the point of being distinctly unhealthy for the rest of us. There are better options. This book from Dr. Korr contains the seed for the development of that alternate future if enough of us choose to act, to make it so.

Read this book if you want to learn and share the ideas with those you care about. You will love what this book has to show you.

The e-book version is available from Amazon.com. To order copies of the paperback, associations or individuals can contact Penguin Random House Customer Service at 1-800-733-3000 or customerservice@penguinrandomhouse.com. Professors seeking info on desk and exam copies should visit https://www.randomhouseacademic.com/desk-exam-copy.

Reference


Georgia Campus – Philadelphia College of Osteopathic Medicine, in the greater Atlanta area, is seeking qualified individuals for a full time faculty position in the Department of Osteopathic Manipulative Medicine (OMM).

Osteopathic Manipulative Medicine Faculty

Responsibilities include but not limited to the following:

- Evaluates, develops and delivers course material to PCOM students in a particular clinical discipline.
- Contributes to the learning of medical students, graduate students, interns and residents through class teaching as well as in one-on-one out of class situations.
- Serves in leadership and membership capacities on college and faculty committees.
- Actively pursues scientific research or other scholarly activity in one or more areas of scientific study.
- Participates in professional and scientific meetings to further individual knowledge and to contribute to the development of other professionals.
- Prepares and delivers presentations to other professionals at PCOM and during local/regional/national professional and scientific meetings.
- Evaluates student progress in learning appropriate medical knowledge. Communicates these evaluations to the student and administrative/faculty members as appropriate.
- Maintains active licenses and board certification in specialty
- Other duties as assigned

The successful applicant will have a D.O. degree board eligibility or board certification in Osteopathic Neuromusculoskeletal Medicine and Osteopathic Manipulative Medicine. The candidate needs to have or be eligible for a license to practice Osteopathic Medicine in the State of Georgia. Preference may be given to applications with an ABPTS certification or residency / fellow ship experience.

The review of applications will begin immediately and continue until the position is filled. Salary for this position will be commensurate with experience and qualifications. To apply for the position please visit our employment opportunities website at www.pcom.edu/jobs or email resume to hr@pcom.edu. All inquiries must include: a letter of intent, a curriculum vitae, salary requirements, and three (3) references, preferably from current or former supervisors. Please reference position number: 001881
National Institutes of Health and Osteopathic Medicine: Another call for action and equality in a legal struggle won long ago

Brian P. Peppers, DO, PhD; Janice U. Blumer, DO, FAAO; Robert W. Hostoffer, DO, LhD, FAAP, FACOP, FACOI, FCCP; Michael P. Rowane, DO, MS, FAAFP, FAAO; Kevin A. Thomas, DO, MS; and Thomas R. Byrnes Jr., DO

Abstract
Discrimination, whether by conscious or unconscious means, can have significant and often long-lasting negative consequences on the afflicted group or individual. The osteopathic culture and field of medical practice has long fought for equal rights and recognition among their allopathic medical peers. Almost 90 years have passed since Congress, in 1929, declared allopathic and osteopathic medical degrees equivalent. Despite this, key resources and positions within the medical and research profession continue to be inequitable for the osteopathic community. There exists a severe paucity of osteopathic involvement at the National Institutes of Health today and throughout its history. Herein, the historic and current unequal representation of the osteopathic culture from the National Institutes of Health and MEDLINE is investigated.

Introduction
Discrimination, whether by conscious or unconscious means, can have significant and often long-lasting negative consequences on the afflicted group. Many theories have been developed to help explain the driving force of discrimination. The need for self-esteem (positive social status from within a group rather than outside a group), status (hierarchies within society), and self-interest (preserving resources) are among the most common elements. The actions of the offending group need not be carried out in an overt conspiratorial manner to have a coordinated effect on another group or person. Many individuals within the group carrying out the offense need not be involved, unaware of the problem or may even be openly opposed to the actions.

The osteopathic culture and field of medical practice has long fought for equal rights and recognition among their allopathic medical peers. Almost 90 years have passed since Congress, in 1929, declared MD and DO equivalent degrees. As with many examples of discrimination, societal acceptance is not achieved the instant a law is passed. Many battles have been fought and won.

(continued on page 10)
including the right to join the military as a physician, which was withheld until 1966 despite laws granting inclusion many years previously.\(^2\)

In 1938, Congress declared osteopathic physicians to be designated as “physicians” within the provisions of the Federal Compensations Act.\(^2\) In that same year, Congress approved new buildings to be constructed and the National Institutes of Health to be moved to Bethesda, Maryland.\(^3\)\(^4\) Despite the movements in equality, key resources and positions within the medical and research professions continued to be withheld from the osteopathic community. There is a severe paucity of osteopathic involvement at the National Institutes of Health today and throughout its history. Herein, the historic and current status of the osteopathic culture in the National Institutes of Health and MEDLINE is explored.

**Methods**

Public records from 1999 to the present, including congressional powers for the National Institutes of Health (NIH), the National Center for Complementary and Alternative Medicine (NCCAM, now called the National Center for Complementary and Integrative Health or NCCIH), the National Library of Medicine (NLM), and associated advisory committees, were obtained.

Content investigated included board and committee members, meeting minutes, current and historical bylaws or manuals used by the boards or committees, as well as a cross-reference of committee and board members with other influential branches of the NIH. Cross-sectional analysis of the initial 2018 members of all the national advisory committees (NAC) for the individual NIH organizations and centers was conducted. The NAC member degrees were assumed accurate on the NIH website when listed. When they were not listed, a public internet search was conducted. The member composition of the National Cancer Institute’s national advisory committee in 1938 and 2018 was compared as it is the only remaining NIH institute from 1938. The Federal Advisory Committee Act database was searched for the total osteopathic physician make-up of all federal advisory committees (FAC) in the entire US Department of Health and Human Services (HHS) agency from 1997 to 2017. Allopathic physician make-up of the FAC in the entire HHS for years 1997 and 2017 was also determined. Funding of the NIH since 1938 was determined. A Freedom of Information Act (FOIA) request was filed for conflicts of interest on the members from 2000 to present day on the NLM program advisory committee called the Literature Selection Technology Review Committee (LSTRC). Additional FOIA requests for a copy of originally signed National Advisory Council for Complementary and Alternative Medicine (NACCAM) first meeting minutes were made. PubMed’s inclusion of osteopathic journals actively being cataloged through MEDLINE was determined.
Table 1. NIH institutes and centers and their 2018 funding. (Funding provided in thousands.)

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<td>NCI</td>
<td>5,964,800</td>
</tr>
<tr>
<td>National Eye Institute</td>
<td>NEI</td>
<td>772,317</td>
</tr>
<tr>
<td>National Human Genome Research Institute</td>
<td>NHGRI</td>
<td>556,881</td>
</tr>
<tr>
<td>National Heart, Lung and Blood Institute</td>
<td>NHLBI</td>
<td>3,383,201</td>
</tr>
<tr>
<td>National Institute on Aging</td>
<td>NIA</td>
<td>2,574,091</td>
</tr>
<tr>
<td>National Institute on Alcohol Abuse and Alcoholism</td>
<td>NIAAA</td>
<td>509,573</td>
</tr>
<tr>
<td>National Institute of Allergy and Infectious Diseases</td>
<td>NIAID</td>
<td>5,260,210</td>
</tr>
<tr>
<td>National Institute of Arthritis and Musculoskeletal and Skin Diseases</td>
<td>NIAMS</td>
<td>586,661</td>
</tr>
<tr>
<td>National Institute of Biomedical Imaging and Bioengineering</td>
<td>NIBIB</td>
<td>377,871</td>
</tr>
<tr>
<td>Eunice Kennedy Shriver National Institute of Child Health and Human Development</td>
<td>NICHD</td>
<td>1,452,006</td>
</tr>
<tr>
<td>National Institute on Drug Abuse</td>
<td>NIDA</td>
<td>1,383,603</td>
</tr>
<tr>
<td>National Institute on Deafness and Other Communication Disorders</td>
<td>NIDCD</td>
<td>459,974</td>
</tr>
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<td>National Institute of Dental and Craniofacial Research</td>
<td>NIDCR</td>
<td>447,735</td>
</tr>
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<td>National Institute of Diabetes and Digestive and Kidney Diseases</td>
<td>NIDDK</td>
<td>2,120,797</td>
</tr>
<tr>
<td>National Institute of Environmental Health Sciences</td>
<td>NIEHS</td>
<td>828,492</td>
</tr>
<tr>
<td>National Institute of General Medical Sciences</td>
<td>NIGMS</td>
<td>2,785,400</td>
</tr>
<tr>
<td>National Institute of Mental Health</td>
<td>NIMH</td>
<td>1,754,775</td>
</tr>
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<td>National Institute on Minority Health and Health Disparities</td>
<td>NIMHD</td>
<td>303,200</td>
</tr>
<tr>
<td>National Institute of Neurological Disorders and Stroke</td>
<td>NINDS</td>
<td>2,188,149</td>
</tr>
<tr>
<td>National Institute of Nursing Research</td>
<td>NINR</td>
<td>158,033</td>
</tr>
<tr>
<td>National Library of Medicine</td>
<td>NLM</td>
<td>428,553</td>
</tr>
</tbody>
</table>

All names, although public information of unelected officials, are withheld out of professional respect.

Kolmogorov-Smirnov and Kruskal-Wallis tests, with 95% confidence interval were conducted as specified in the results section of the study using GraphPad Prism 7.

Results

National Institutes of Health

The National Institutes of Health can be traced back to 1887 when it was first called the Laboratory of Hygiene and exclusively contained within the Marines Hospital Service (MHS). In 1891, the name was changed to The Hygienic Laboratory which then officially became the NIH in 1930.

The powers granted to the NIH by Congress are included in the Public Health Service Act. The NIH is further divided into institutes and centers totaling 27 as of 2018 (Table 1). Each institute and center has its own federal advisory council(s).

The total funding granted to the NIH since 1938 had reached more than $700 billion as of 2017. Time adjusted for inflation that number increases to over 1 trillion dollars. An additional $34.8 billion has been allocated for 2019. Allocation of funds and creation of individual institutes/centers is directed by Congress and, to a degree, by the director of the NIH. An osteopathic physician has never been director of the NIH. In addition, there has never been an institute/center dedicated to osteopathic medicine, even taking into account those that have changed names over the years.

The NIH has specific residencies and fellowships for various medical disciplines, which osteopathic physicians have filled. An NIH residency or fellowship program, however, has never been created for osteopathic medicine. Some positions in the NIH are appointed, others are open to applications. As with similar entities,
applications are processed by those within or associated with the organization.

There are several different types of federal advisory committees: national, program, board of scientific counselors, and initial review groups (each may have subcommittees discussed below). Of the 27 organizations and centers, 25 have national advisory councils. A cross-sectional analysis of all 25 groups at the change of 2017-18 revealed 1 osteopathic physician member out of 214 possible positions filled by physicians (Table 2).^{11}

(continued on page 13)

Table 2. Selected professional composition of the National Advisory Committees. Because members may hold multiple degrees, totals degree totals may not add up to total positions filled.

<table>
<thead>
<tr>
<th>NIH Institute or Center</th>
<th>National Advisory Committee (NAC) 2018*</th>
<th>Total Positions</th>
<th>MDs^b</th>
<th>DOs^b</th>
<th>PhDs</th>
<th>Other^c</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD</td>
<td>Councils of Councils (COCS)</td>
<td>26</td>
<td>11</td>
<td>13</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>FIC</td>
<td>Fogarty International Center Advisory Board (FICAB)</td>
<td>15</td>
<td>11</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>NCATS</td>
<td>National Center for Advancing Translational Sciences Advisory Council (NCATSC)</td>
<td>16</td>
<td>9</td>
<td>7</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>NCCIH</td>
<td>National Advisory Council for Complementary and Integrative Health (NACCIH)</td>
<td>14</td>
<td>4</td>
<td>11</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NCI</td>
<td>National Cancer Advisory Board (NCAB)</td>
<td>23</td>
<td>13</td>
<td>7</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>NEI</td>
<td>National Advisory Eye Council (NAEC)</td>
<td>16</td>
<td>9</td>
<td>10</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NGR</td>
<td>National Advisory Council for Human Genome Research (HGRAC)</td>
<td>13</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NHLB</td>
<td>National Heart, Lung, and Blood Advisory Council (NHLBAC)</td>
<td>17</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NIA</td>
<td>National Advisory Council on Aging (NACA)</td>
<td>22</td>
<td>14</td>
<td>10</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NIAAA</td>
<td>National Advisory Council on Alcohol Abuse and Alcoholism (NCAA)</td>
<td>23</td>
<td>9</td>
<td>13</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NIAID</td>
<td>National Advisory Allergy and Infectious Diseases Council (NIAIDC)</td>
<td>23</td>
<td>16</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIAMS</td>
<td>National Arthritis and Musculoskeletal and Skin Diseases Advisory Council (NAMSAC)</td>
<td>17</td>
<td>10</td>
<td>7</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>NIBIB</td>
<td>National Advisory Council for Biomedical Imaging and Bioengineering (NACBIB)</td>
<td>15</td>
<td>6</td>
<td>9</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NICHD</td>
<td>National Advisory Child Health and Human Development Council (NACHD)</td>
<td>13</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NIDA</td>
<td>National Advisory Council on Drug Abuse (NACDA)</td>
<td>20</td>
<td>10</td>
<td>7</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>NIDCD</td>
<td>National Deafness and Other Communication Disorders Advisory Council (DCAC)</td>
<td>23</td>
<td>8</td>
<td>16</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>NIDCR</td>
<td>National Advisory Dental and Craniofacial Research Council (NADRC)</td>
<td>13</td>
<td>2</td>
<td>12</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NIDDK</td>
<td>National Diabetes and Digestive and Kidney Diseases Advisory Council (DKNAC)</td>
<td>19</td>
<td>9</td>
<td>11</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NIEHS</td>
<td>National Advisory Environmental Health Sciences Council (NAEHSC)</td>
<td>23</td>
<td>7</td>
<td>15</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NIGMS</td>
<td>National Advisory General Medical Sciences Council (NAGMSC)</td>
<td>18</td>
<td>2</td>
<td>16</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NIMH</td>
<td>National Advisory Mental Health Council (NAMHC)</td>
<td>23</td>
<td>13</td>
<td>13</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NIMHD</td>
<td>National Advisory Council on Minority Health and Health Disparities (NAMHHD)</td>
<td>15</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>NINDS</td>
<td>National Advisory Neurological Disorders and Stroke Council (NANDSC)</td>
<td>20</td>
<td>8</td>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NINR</td>
<td>National Advisory Council for Nursing Research (NACNR)</td>
<td>16</td>
<td>2</td>
<td>14</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NLM</td>
<td>Board of Regents of the National Library of Medicine (BOR)</td>
<td>19</td>
<td>8</td>
<td>7</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Total Positions Filled</strong></td>
<td></td>
<td><strong>462</strong></td>
<td><strong>213</strong></td>
<td><strong>244</strong></td>
<td><strong>53</strong></td>
<td></td>
</tr>
</tbody>
</table>

* The National Clinical Center (CC) and the Center for Scientific Review (CSR) do not list or have National Advisory Committees.

^b In the United States, allopathic physicians (MDs) and osteopathic physicians (DOs) are legally equal degrees.

^c Additional members include lawyers, veterinarians, dentists, chiropractors, naturopaths, dieticians, optometrists, and others.
Of note, various positions are filled by the same individual. This was particularly common for the NIH’s legal team and instances wherein the director of the NIH was a part of the committees. Among the 244 positions filled by doctors of philosophy as committee members, none were employed by colleges of osteopathic medicine (Table 2).

At the end of 2017, there were nearly 100 additional programs, boards of scientific counselors, and initial review groups. All of these are federal advisory committees. Each committee was made up of a similar number of members as the national committees (average of 18.5 individuals per committee). Only 1 osteopathic physician was found in the remaining advisory committees. The total representation of the osteopathic profession in federal advisory committees was 2 individuals out of an estimated 2,300 possible positions at the end of 2017 to the beginning of 2018 (<<0.5%).

The osteopathic field’s presence and representation within the entire HHS FAC in 1997 was 0.67% (26 out of 3,861) of the total positions held by all physicians (allopathic plus osteopathic). In 2017, this percentage decreased to 0.27% (28 of 10,404) with the allopathic field representing virtually 100% of the physicians within the HHS FAC. This includes all the NIH subcommittees, where the majority of the osteopathic representation can be found. Subcommittees or special emphasis panels (SEP) are ad hoc panels for one specific issue or a single meeting. The male-to-female mean and standard deviation of medical doctor positions filled in the HHS FACs by the osteopathic field from 1997 to 2017 is 25.1 +/- 4.5 (males) and 8.2 +/- 2.7 (female).

The National Cancer Institute’s first national advisory committee was established in 1938 (one of the oldest advisory committees in the NIH). In that year, there were no osteopathic physicians on the committee of 5 doctors (2 allopathic, 1 allopathic and doctor of science, 1 doctor of philosophy, 1 doctor of science). The percent change or growth from 1938 to 2018 of osteopathic medical physicians on the National Cancer Advisory Board (NCAB) was zero. A program advisory committee in the NCI did include the second osteopathic physician on a federal advisory committee within the NIH at the start of 2018. There have also been prominent osteopathic physicians in the oncology field at the NIH. One in particular has served on numerous FACs over the past 20 years.

National Center for Complementary and Integrative Health

In 1991, Congress instructed the NIH to establish an office to investigate the growing public interest in complementary and alternative medicine. The Office of Alternative Medicine continued until 1998 when Congress elevated this office to a national center to begin actively researching complementary and alternative medicine.

Present-day explicit representation of osteopathic terminology for the purpose of funding and grants resides within the National Center for Complementary and Integrative Health (NCCIH) under the section of manipulations alongside chiropractors (Table 1). However, there is no direct link to the American Osteopathic Association (AOA) or any osteopathic organization, and the section is dominated by chiropractor URLs within the manipulations section. (Although not connected to the NCCIH, direct links to the AOA on the National Institute on Drug Abuse (NIDA) website were found during this investigation.)

An osteopathic physician has never served as director of the NCCIH or in the director’s office. Four osteopathic physicians have served on the NCCIH’s advisory council (NACCIH). The first osteopathic physician on the NACCIH was an ad hoc member in May 2001, a former director of the National Institute of Neurological Disorders and Stroke from 1982 to 1993. Previous to the formal start of the NCCIH in August 1999, 2 osteopathic physicians from outside the NIH served on the transition committee (May 1999).

Since that transition committee in 1999, there have been 4 years when there has not been sustained osteopathic representation (1999-2001 and 2016-present). At times since 1999, the only...
(continued from page 13)

means of representation was by ad
hoc members in SEPs and mem-
bers of the American Association
of Colleges of Osteopathic Medicine
(AACOM) attending meetings as
part of the general public. The
general public cannot participate in
closed sessions and has no influence
in these closed sessions.

Since 2000, $2 billion has been
allocated to the NCCIH. There have
been numerous allopathic, naturopathic and chiropractic practitioners
that have served on the NACCIH
and in the NCCIH’s director’s office
since its first meeting in August
1999. Although the actual numbers
of naturopathic and chiropractors
each doubled the number of osteo-
pathic physicians, a Kruskal-Wallis
test of the 3 professions was statisti-
cally insignificant (P<0.3648). A
Kruskal-Wallis test of all profes-
sions was statistically significant,
P<0.0001. A Kruskal-Wallis test of
allopathic and osteopathic gender
was also significant, P<0.0001 (Fig-
ure 1).

Within the first meeting of the
National Advisory Council for
Complementary and Alternative
Medicine (NACCAM), discussions
centered around how the NIH orga-
nization came to be and the focus of
the research grants to be allocated. Searching for the word
osteopath in the first meeting’s minutes of record
online revealed 4 results (Image 1).
As depicted in Image 1, the words
were not visible during the initial
investigation on January 9, 2018.
On April 3, 2018 (10 days after the
first public disclosure of the investigation), the website was modi-
fied to include osteopathic medicine in the visible text.

A JavaScript investigation into the 4 missing/hidden incidences
of the word osteopath revealed an additional note explaining
osteopathic medicine (Image 2). According to Image 2, the words
osteopathic medicine should appear in the empty space between
“such as(), naturopathy” depicted in Image 1. If coded correctly, the
reader(s) would be able to view a description of osteopathic medi-

(continued on page 15)
cine in a pop-up or rollover window by simply hovering the cursor over the phrase osteopathic medicine. The coding was in such error that neither was possible (see discussion below). The coding for the pop-up option definition was not corrected on April 3, 2018; it was simply removed altogether.

The hidden/removed paragraph text states:

Osteopathic Medicine is a complete system of medical care that employs a “whole person” approach to health care and is based on the body’s natural tendency toward health and self-healing. Osteopathic physicians (DOs) can use osteopathic manipulative treatment, a system of manual therapy, to treat mechanical strains affecting all aspects of the anatomy, relieve pain, and improve physiologic function.

On February 7, 2018, in response to a FOIA request for a copy of the original signed meeting minutes as displayed on the Web page, the NCCIH provided a PDF of the Web page in question as an official response to the request. The PDF, as in Image 1, did not mention osteopathic medicine. A second FOIA request insisting on a copy of original signed meeting minutes of record and not a copy of the Web page was made that same day. On May 11, 2018, the NCCIH response through the NIH FOIA office indicated that a signed document could not be found.

In the past several years, no grants have been awarded specifically to osteopathic physician principal investigators from the NCCIH. The low amount of NIH funding in osteopathic medicine in general has been cited several times in the literature.

**National Library of Medicine**

The National Library of Medicine (NLM) is one of the 27 organizations within the NIH. However, its origins predate the NIH as it was started in 1836. Similar to the NIH, the NLM was initiated by the military. In 1871, the first librarian of what would become the NLM, John Shaw Billings, envisioned the library to be “as complete as possible in all publications relating to military organization, medicine, and the allied sciences” and would be “an universal library of references.” The NLM’s objective is outlined in the Public Health Service Act. One of the main roles of the NLM is outlined in Figure 2.

**Figure 2.** Partial list of powers granted by Congress to the National Library of Medicine in the Public Health Service Act.

**PURPOSE, ESTABLISHMENT, AND FUNCTIONS OF THE NATIONAL LIBRARY OF MEDICINE**

SEC. 465. [286] (a) In order to assist the advancement of medical and related sciences and to aid the dissemination and exchange of scientific and other information important to the progress of medicine and to the public health, there is established the National Library of Medicine (hereafter in this part referred to as the “Library”).

(b) The Secretary, through the Library and subject to subsection (d), shall— (1) acquire and preserve books, periodicals, prints, films, recordings, and other library materials pertinent to medicine; (2) organize the materials specified in paragraph (1) by appropriate cataloging, indexing, and bibliographical listings; (3) publish and disseminate the catalogs, indexes, and bibliographies referred to in paragraph (2)...

**Figure 3.** Members of the National Library of Medicine’s Board of Regents.

**BOARD OF REGENTS**

SEC. 466. [286a] (a)(1)(A) The Board of Regents of the National Library of Medicine consists of ex officio members and ten members appointed by the Secretary.

(B) The ex officio members are the Surgeons General of the Public Health Service, the Army, the Navy, and the Air Force; the Chief Medical Director of the Department of Veterans Affairs, the Dean of the Uniformed Services University of the Health Sciences, the Assistant Director for Biological, Behavioral, and Social Sciences of the National Science Foundation, the Director of the National Agricultural Library, and the Librarian of Congress (or their designees).

(C) The appointed members shall be selected from among leaders in the various fields of the fundamental sciences, medicine, dentistry, public health, hospital administration, pharmacology, health communications technology, or scientific or medical library work, or in public affairs. At least six of the appointed members shall be selected from among leaders in the fields of medical, dental, or public health research or education. [emphasis added]
The phrase “pertinent to medicine” in Section b-1 is of particular importance for discussions below. One of the items collected and indexed for dissemination by the NLM is journals. Starting in 1879, the journals were organized into Index Medicus, a bibliographic index. Today, the online version of this index is called MEDLINE. PubMed has several roles, but one is as a search engine of MEDLINE. Congressional powers are directly granted to the national advisory committee called the Board of Regents (BOR) for the tasks listed in Figure 2.\textsuperscript{29} There are 19 members on the BOR. They are specifically outlined and listed in Figure 3.\textsuperscript{29}

The only osteopathic physician to ever serve on the BOR (ex officio), Ronald R. Blanck, was the surgeon general of the Army.\textsuperscript{30} The appointment was earned 30 years after DOs were allowed to enlist into the military as physicians in 1966.\textsuperscript{2}

**Literature Selection Technical Review Committee**

Although the Congressional powers are granted/tasked to the BOR, the NLM’s program advisory committee, called the Literature Selection Technical Review Committee (LSTRC), has chiefly determined which journals are allowed into MEDLINE.\textsuperscript{31} At times, consultants are asked to review journals on content that is not the expertise of the committee members. No osteopathic physicians were found on the committee, nor were records found indicating that an osteopathic physician has ever been a guest speaker for or been consulted by this committee.\textsuperscript{32}

The LSTRC selection process operates on a closed, single-blinded review process guided by their collection development manual (CDM) for journal selection, and there are no appeals.\textsuperscript{33} Issues reoccurring in the LSTRC minutes are in reference to the need for “high quality journals,” “quality of evidence,” and “peer review process.” In 2001, there was a debate seen in the minutes of the committee on these very issues:

A discussion item that the Committee addressed at several intervals during the meeting was the role of LSTRC in filtering journals. Some members took a more libertarian approach than others in terms of letting users decide what is useful. Others feel this question gets to the heart of LSTRC’s responsibility, i.e., that is determining outstanding quality of content, importance, and editorial processes. The bar must be kept high so users retrieve what is truly useful to them. The discussion then migrated to the importance of non-U.S. journals that report on local or regional public health issues. All agreed that some of these journals may not have all the attributes of Western Europe and North American journals, but are valuable additions to MEDLINE. The LSTRC Summary Form will be revised for the next meeting to give this attribute a numerical score. It is now a check-off box. The broad theme of this discussion will resume at the June meeting.\textsuperscript{34}

Since 2000, all journals that bear the name osteopathic and have applied for indexing in MEDLINE have been denied (2 in total, 1 denied twice). In contrast, Chiropractic and Manual Therapies was accepted for indexing in 2017.\textsuperscript{35} This same journal included osteopathic in its title from 1992 to 2010.\textsuperscript{36} There is currently only 1 journal that bears the name osteopathic that is indexed in MEDLINE and readily obtaining PubMed ID numbers: The Journal of the American Osteopathic Association (JAOA).\textsuperscript{37} The journal Osteopathic Medicine and Primary Care was an open access journal indexed in PubMed and PubMed Central (PMC) from 2007 to 2010 by means of BioMed Central (BMC).\textsuperscript{38} This method of obtaining PubMed and PMC indexing bypasses MEDLINE and review by the LSTRC.\textsuperscript{38} Several papers have been published on the selection process as well as some detailed facts on the NLM website.\textsuperscript{33,39,40} Initially, it had been asserted by an NLM LSTRC member that “many new journals do get recommended for inclusion.”\textsuperscript{39} However, per the NLM’s own records, less than 50% are approved, with many years ranging from 14% to 30%.\textsuperscript{32,41}

**Collection Development Manual**

The choice of the authors charged with updating the Collection Development Manual (CDM) is not the LSTRC, but rather an internal NLM Collection Development Review Committee. Again, consults are stated to have been done when needed.\textsuperscript{32} There have been several versions over the past 50 years; however, there has never been a section on osteopathic medicine specifically.\textsuperscript{43} Osteopathy had traditionally been listed under therapeutics in the 1977, 1985, and 1993 versions of the CDM.\textsuperscript{44-46} The only explicit reference to osteopathy under medicine rather than under therapeutics was in indicating the decision to exclude osteopathic medicine from the CDM’s 1985 and 1993 versions.\textsuperscript{45,46} Medicine is listed in the same fashion along with other medical practices, but allopathic medicine is not explicitly mentioned. The most current CDM, which has 101 subjects listed for collection, was published in 2004 (about 5 years after the first NCCIH meeting from Images 1 and 2).\textsuperscript{47} Only 1 committee member of the LSTRC from 2004 is listed as an author of the manual.\textsuperscript{47} For the first time all direct mention of osteopathic medicine or osteopathy was removed, even under therapeutics or the Complementary and Alternative subject section.\textsuperscript{47} Osteopathic manipulative medicine (OMM) and osteopathic medicine are also missing from the NLM website on subjects being indexed as of March 26, 2018.\textsuperscript{48} This is despite the BOR minutes (Section III) in February 2001 referring to osteopathy as part of NCCAM under manipulations:

...Director of NIH’s National Center for Complementary and Alternative Medicine (NCCAM), began by defining complementary and alternative medicine as “those modalities that primarily are consumer-driven, unproven, and not extensively incorporated into the training or practice of mainstream Ameri-
can physicians.” These modalities (and there are thousands of them) are increasingly pervasive and used by an estimated 83 million U.S. adults (1997). Approximately $30 billion were spent on them in the last year. The NCCAM Web site gets a half million hits per month. [The director of NCCAM] divided the modalities into five areas: alternative medical systems (“parallel universes” of health care, such as traditional Chinese medicine), mind-body interventions (biofeedback, hypnosis, art therapy), biologically based treatment (such as herbs), manipulative body-based methods (chiropractic and osteopathic manipulation, massage), and energy therapies (flows of energy through the body). There is a general lack of scientific tradition in the field, and there are few competent scientific investigators. In 1998 Congress mandated the establishment of a Center at NIH to address these modalities by supporting basic and applied research and research training. Increasing funds have been appropriated to do this ($89 million in FY 2001). NCCAM has developed a strategic plan that includes emphasis on training investigators, engaging in education and outreach activities to the public and facilitate the integration of complementary and alternative medicine best practices with mainstream practices. [emphasis added]

The 2004 CDM very closely defines complementary and alternative medicine with the words used above and the notable omission of osteopathic manipulation (see Figure 4). On March 26, 2018 (3 days after the first public disclosure of the investigation), both the CDM 2004 and NLM guideline website on subjects being indexed were edited. However, only the website mentions osteopathic manipulation under CAM. This is the only section found out of 101 where the CDM and the NLM subjects guideline website are not identical. Incidentally, the index for NLM subjects guideline website was not updated to include osteopathic manipulation.

The LSTRC committee members’ associations in the conflict of interest (COI) information are not obtainable under the Freedom of Information Act. According to email correspondence with the NIH Freedom of Information Act Office (January 4, 2018), this is because the COI is contained in the US Office of Government Ethics Form 450: Confidential Financial Disclosure Report. Part III of this form has them list their outside positions, but not salaries per se. Even so, no part of the form can be released even if all identifiers and years are removed. Many of the committee members have been, or are, editors of prestigious journals.

A Kolmogorov-Smirnov analysis of allopathic versus osteopathic LSTRC members since 2000 is significant with a P<0.0001. A Kruskal-Wallis test of the LSTRC medical degree and gender since 2000 was also statistically significant P<0.0002 (Figure 5).

Information Rx

Another set of discussions in the NLM BOR minutes is seen in 2003-04 involving the NLM launch of a national campaign called Information Rx through MedlinePlus. Its purpose was to spread the importance of educating the public about their illnesses or diseases. Within the BOR minutes from 2004 to 2006, multiple references to joint workshops by the NLM, American College of Physicians and the American Medical Association (AMA) at national conferences were discussed. In 2007, several years after the official start of Information Rx, the BOR minutes noted the Information Rx program was incorporating the AOA.
Specific Selection Factors
Review of membership rosters of pertinent agencies, especially those having review panels in related disciplines.
Observation of applications reviewed by other consultants or temporary members at regular scientific and technical peer review committee meetings; participants on project site visit teams; or those who have provided written collateral opinions on request.
Review of NIH's enterprise-wide database system and other databases for potential nominees with specific expertise.
Review of NIH applicant and grantee files as well as curriculum vitae and publications of investigators.
Review of membership rosters of pertinent academic Centers and an increased air of prestige.
Review of major scientific journals and publications in the field.
Attendance at relevant professional meetings. These meetings provide a valuable method of keeping informed of significant new studies in the field and of identifying the investigators who are doing the type of research needed; gaining knowledge of the interests and expertise of possible future members and consulting with eminent investigators who may be potential members.
Solicitation of names of outstanding investigators from former and current committee members and other leaders in the field.
Solicitation of names in the Federal Register.
Observation of applications reviewed by other agencies, especially those having review panels in related disciplines.
Self-nominations from qualified individuals.

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<th>Factor Number</th>
<th>Specific Selection Factors</th>
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<tr>
<td>1</td>
<td>Personal knowledge of both the required discipline and the scientists who are making significant research contributions to the field.</td>
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<tr>
<td>2</td>
<td>Observance of investigators who serve as ad hoc consultants or temporary members at regular scientific and technical peer review committee meetings; participants on project site visit teams; or those who have provided written collateral opinions on request.</td>
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<tr>
<td>3</td>
<td>Solicitation of names of outstanding investigators from former and current committee members and other leaders in the field.</td>
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<td>4</td>
<td>Consultation with scientific and professional staff of the various NIH institutes and centers as well as the Office of the Director offices.</td>
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<tr>
<td>5</td>
<td>Review of NIH's enterprise-wide database system and other databases for potential nominees with specific expertise.</td>
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<tr>
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<td>Review of NIH applicant and grantee files as well as curriculum vitae and publications of investigators.</td>
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Discussion
Discrimination has no boundaries, and those afflicted are often at a severe disadvantage to identifying the source, gathering proof and initiating action against it. Among the many forms of discrimination, sabotage by neglect is one of the hardest to detect.\(^57^\) The concept of sabotage by neglect centers around providing advantages to the in-group, while not extending the same to the out-group. It avoids detection because withholding support is silent compared to outright attacks.\(^57^\) Without an appropriate needs assessment of the out-group, the grants created, infrastructure, training, and information disseminated naturally favor the needs assessment of the in-group.

One of the limitations of this investigation is it is limited to publicly available data, and intent cannot be determined. It is likely that both intentional and unintentional discrimination have occurred. Based on historical perspectives, the probability of intentional acts are higher from those who have long since retired.\(^58^\) Regardless, this overt bias has been unchecked for more than 90 years.

A point to be made is that references to the allopathic field in this manuscript are used for brevity. It is not reflective of the individual allopathic physicians, many of whom help train and advocate for osteopathic physicians and their philosophy of treatment. Specifically, the in-group with the NIH has been predominated by research-focused allopathic physicians and the scientists that work closely with them or at associated institutions (Table 2).

Putting It All Together
Financial implications
The NIH is critically important for resources to be utilized towards research, facilities and training. This critical resource exists above the clinical funding from Medicare, Medicaid, commercial insurance and student loans along with educational support from Health Resources and Services Administration (HRSA) for medical education. Another aspect of the NIH is the critical salary support it provides for educators and researchers around the country. Grants awarded by the NIH facilitate enhanced student, resident, and fellow training opportunities regardless of direct attachment to “Academic Centers” and an increased air of prestige.

All the federal advisory committees at the NIH are subject to the Federal Advisory Committee Act (FACA) of 1972, which “requires that membership be fairly balanced in terms of points of view represented and the functions to be performed by the advisory committee. NIH ensures representation of women and minorities, diverse representation in member expertise...”\(^59^\) The limited inclusion of osteopathic physicians effectively renders for the past 45 years nearly every advisory committee in the NIH and the entire HHS in violation of the FACA.\(^60^\) The inclusion of less than 1% is not fairly balanced and serves nothing more than to check a box by the in-group when osteopathic medical school graduates make up 25% of all medical school graduates in the United States.

Representation
The NIH reports factors they weighed for selection of advisory committee members as seen in Table 3.\(^61^\) Many of the factors run the risk of selection bias. They depend on the NIH’s direct knowledge of you, your publications in MEDLINE/PubMed journals, and your expertise in related disciplines.

(continued on page 19)
or your attendance at national conferences that members of the in-group would likely attend (Table 3, Factors 1-11). There is, however, the option of self-nomination as 1 of the 12 factors listed.

The comment about qualified individuals in the self-nominated factor, although a natural stipulation, raises the concern of qualified according to whom? Should Factors 1-11 be used to determine who is qualified by the in-group, a vicious and unfair cycle is realized. This is particularly true when some “pertinent” professional societies have a history of not extending membership to AOA-only–trained physicians. To compound the problem, the osteopathic representation has decreased over the past 20 years within the entire HHS in all the FACs (particularly the last 5 years). This minimizes opportunities to be noticed in other committees as many of the factors listed specify as important.

Having adequate representation in all advisory committees also allows for committee members to advocate for types of grants needed, bring back to their hospitals, medical colleges and geographic regions personal knowledge of things to come and how/when to apply. For the in-groups the potential for insider information and the “meme” advantage cannot be overlooked (meme is a theory about the transmission of ideas or behaviors that spread from person-to-person in a self-replicating manner within a culture or group).62

The cross-sectional analysis of all NIH national advisory committees is representative of the fact that osteopathic principles and practice (OPP) and osteopathic tenets encompass all aspects of health, not just osteopathic manipulative medicine.63 This article’s additional focus on the NLM and NCCIH centers around concerns of free speech, free markets, and the discovery of the hidden text. The chronicity uncovered in this investigation depicts connections to critical issues affecting the progressing transition to the Single Accreditation System (SAS) for postgraduate education for all physicians (allopathic and osteopathic) in the US.

**Sabotage by neglect**

The results of this investigation indicate that needs assessment, resources and positions have been intentionally or unintentionally made harder to obtain, delayed or withheld from the osteopathic community, while simultaneously being extended to the allopathic field (Figure 6).

Concealing discussions about osteopathic medicine in the NCCAM’s first meeting minutes on a government website is of extreme concern (Images 1 and 2). This alone warrants further investigation. Another limitation of this investigation is knowledge of when the section on

(continued on page 20)
osteopathy was coded to be invisible in the JavaScript. Prior to the most recent update on April 3, 2018, the Web page had not been updated since December 15, 2011. When this Web page was first published and what it said is unknown. On April 2, 2018, the NCCIH responded to a Congressman's inquiry about this very issue on behalf of the corresponding author and independent of this investigation. They affirmed that the Web page did contain text that was not visible due to a coding error. They went on to state that the coding previously worked, that they found a second example of this same error affecting osteopathic medicine (which this investigation did not find), and they stated 19 other incidences where this same problem was found. Of the 19, only 1 was disclosed and it did not involve osteopathic medicine.

Although parts of this explanation are plausible, other parts are not. The coding was grossly in error; it would have never worked. The errors are not a simple issue of a link going bad because a website changed its content or name. The question of why the coding was not simply fixed should be answered. The NCCIH response noted that they obtained the definitions that were to pop-up from the AOA. This, however, did not translate into proper care and follow through to ensure a working code. The NIH websites are filled with working rollover and pop-up coding examples; they are common codes for Web pages. Regardless, its occurrence is the main issue of importance. Under the most innocent circumstances, it suggests that either no one was looking or no one cared. Either explanation is unacceptable for organizations that wield such influential power.

This, however, is not the only troubling trend noted. The negligible osteopathic presence in key positions of the NIH director(s), individual NIH institutes, and their respective federal advisory committees (Figure 6, pathways e and j) can be appreciated.

Omission of the osteopathic profession from involvement in NACCAM in 1999 until 2001 demonstrates subversion of the expressed congressional directives and is in violation of FACA. The resulting actions and undertones by the NIH depicted in Image 1, 2 and 3 indicate elements of intentional discrimination against the osteopathic profession by means of neglect. It also supports premeditated special interest favoring the allopathic field. The poor inclusion and dissemination of information to the osteopathic community by the NIH is evident in purely clinical matters such as the Information Rx campaign. A repeated benchmark lag time of 2-4 years on research and purely clinical matters presents a clear opportunity for improvement.

The announcement that osteopathic manipulations are “unproven” in front of the BOR, NIH directors, NLM, and available to the general public is questionable defamation of the osteopathic community. A possible honest mistake, that with a more balanced osteopathic inclusion could have been prevented. At a fundamental level, it is not appropriate for one organization to define what another organization is and be the sole determinant of what is or is not proven. This is an extreme conflict of interest and is out of the realm of content expertise for the allopathic field and research scientists at the NIH. This is evidenced in the NIH’s own recollection of surveys that indicated the allopathic field had a critical lack of knowledge and experience on the subject matter.

The needs assessed or indication to train researchers was never disseminated into the colleges of osteopathic medicine (COMs) or postgraduate training programs in a good faith effort. The possible consequence of primarily supporting the in-group is that within 19 years, allopathic physicians led the non-manipulation side of the complementary, alternative and integrative health field.64 As noted above, in the BOR meeting in February 2001, CAM was a $30 billion dollar industry in 2000 alone.

The allopathic field has only addressed a few aspects of NCCIH in their medical schools and postgraduate training programs, particularly the ones that deal with chemicals from natural products rather than traditional pharmaceuticals. This is not an advancement since natural product research was already underway in other NIH organizations before 1999. At the core of the issue, a chemical is a chemical and still represents materia medica practices; its source in the end is meaningless (many medications already stem from or are natural products). Allopathic medical schools and training programs have not universally addressed the manual medicine aspect of their training. At a minimum, the best way to prevent future occurrences of discrimination is through education and exposure. In the past, education and exposure helped to rescind the “cultist” label that the American Medical Association placed on the osteopathic profession until the 1960s.36

Moving to Pathway j in Figure 6, the absence of osteopathic representation of the LSTRC for MEDLINE inclusion either as a committee member, guest speaker or consultant since 2000 has likely resulted in no growth in the number of PubMed visible journals on osteopathic medicine. The tandem neglect of proper osteopathic inclusion in the NCCIH (or any inclusion until May 2001 after the BOR February 2001 meeting above) and the omission of osteopathy from the CDM in 2004 (after 40 years of inclusion in previous CDMs) is difficult to be assumed as mere coincidence. This is particularly true when authors of the CDM 2004 were present in the BOR’s February 2001 meeting and almost identical wording was used in the meeting by the then-director of NCCAM. The potential of inexperienced authors of the CDM 2004 cannot account for the omission as several of the authors helped write the previous CDMs starting in 1977. One of the authors had worked...
at the NLM since 1968. Any removal of osteopathic terminology should have been balanced with its relocation into another area of the CDM (preferably as its own specific section). The possible interdepartmental collusion to make invisible and omit the osteopathic community should be investigated. This investigation, however, did not reveal any specific connections, rather only a pattern of omissions and delays on or suboptimal inclusion in the NIH FACs. As depicted in Figure 6 by the multiple l pathways, many (but not all) NIH personnel tandemly or in concert have other roles/jobs at the NIH. This has effectively awarded the in-group easier access to a $700 billion tool ($527 billion since 1999) kept to their advantage over the out-group, ie, the osteopathic community. This is not representative of a free and open market for practitioners, medical schools, hospitals, health-related businesses, medical organizations or their respective journals, nor is it in the best interest of scientific discovery.

The recent update of the CDM 2004 CAM section on March 26, 2018, was also commented on by the NLM in response to the Congressman’s April 2, 2018, inquiry. They specifically noted that they had “coincidentally” updated the guidelines just a few days previous. After 14 years of no representation of osteopathy in the CDM 2004, it is difficult to believe that this is mere coincidence. Either way, more corrective action is needed.

The updated CAM guidelines’ Web page and the CDM were strikingly similar on March 26, 2018, except for small grammar alterations and the exclusion of various disciplines including chiropractic and osteopathic manipulation in the CDM 2004 specifically.

From the CDM Web page

for complementary and alternative medicine:
The National Center for Complementary and Integrative Health (NCCIH) classifies most complementary health approaches into one of two subgroups: 1) natural products, including herbs, vitamins, minerals, and probiotics, often sold to consumers as dietary supplements; or 2) mind and body practices, including a large and diverse group of procedures or techniques such as yoga, meditation, and acupuncture, administered or taught by a trained practitioner or teacher. Other complementary health approaches include traditional healers, Ayurvedic medicine, traditional Chinese medicine, homeopathy and naturopathy. For additional information see the NCCIH Web site.

From the CDM 2004:
The National Center for Complementary and Integrative Health (NCCIH) classifies most complementary health approaches into one of two subgroups: 1) natural products, including herbs, vitamins, minerals, and probiotics, often sold to consumers as dietary supplements; or 2) mind and body practices, including

The out-groups at the NIH need not be limited to osteopathic organizations. However, osteopathic physicians are the only legal equivalent to allopathic physicians in the US. This is the only example found of the 101 specific subjects indexed where the guidelines per subject on the NLM guideline website and the CDM 2004 specific section’s text are not the same.

Within 10 days of the first public disclosure of this report, the NCCIH recoded their first meeting minutes to include osteopathic medicine, and the NLM added osteopathic manipulation under CAM in their guidelines website. The problem is, as every osteopathic physician knows, osteopathic medicine is broader than osteopathic manipulative medicine. This is more evidence of the need to explicitly list osteopathic medicine as its own specific subject in the CDM in addition to osteopathic manipulative medicine in CAM. This also supports why a drastic increase in osteopathic physician presence in all the HHS FAC are needed. The less than 1% status quo courts continued errors and misrepresentation.

Medical literature
Back in 2001, the LSTRC debated filtering journals for MEDLINE. The decision to start more aggressive filtering practices is one of significant importance: in-group members empowered themselves. “Pertinent to medicine” was (per the opinion of some of those on the LSTRC back in 2001 and shared by these authors) to mean “was it about or influential to medicine.” As opposed to the practice of: “Do I think it’s important enough within or to medicine?” The omission of osteopathic medicine creates potential first amendment violations.

The literature in the osteopathic community is in many ways electronically invisible or silenced. PubMed is also designed to be of use for the general public and a trusted source of information for all. This creates the illusion of a greater absence of osteopathic literature to the patients for whom we advocate. Moreover, this absence of osteopathic medicine in the PubMed literature creates a sense of lack of credibility in the public eye—for if it isn’t in the literature search, it must not be “credible.” As alluded to in the NCCAM’s first meeting, the allopathic field and, by extension the NIH, lacked experience and training in osteopathic medicine. Thus, without at a minimum consultations with osteopathic physicians, the LSTRC cannot act as peer reviewers. This makes the LSTRC, in this instance, one of the lowest quality peer-review methods in

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the medical literature realm. As shown in Figure 7, this closed review process occurs after the journals true peer review process has taken place and filters information back to professionals doing the actual research and the general public.

What the in-group would call filtering, others may call censorship. In these authors’ opinions, it is not appropriate for a federal organization to utilize a policy of censorship to determine what US citizens’ tax-funded databases contain.

Within the CDM 2004 under the general medicine section, the scope of collection includes thought. As a result, the continued inclusion of the journal Medical Hypotheses may have been upheld in closed sessions after open discussions in the LSTRC indicated concerns about the journal. This essentially establishes the minimum threshold level for evidence required for collection. Any mandated level of evidence above thought or hypotheses in a peer reviewed journal on osteopathic medicine can be construed as a double standard. To the osteopathic community, osteopathic medicine is general medicine; it is not the combination of general medicine and manipulative medicine.

In support of a more selective process, the issue brought up in the LSTRC 2001 meeting of the user being able to “retrieve what is truly useful to them,” is ironically redundant. A decade prior, the NLM aided in the initiative of publishing practice parameters and guidelines to aid clinicians in “retrieving what is truly useful to them.” The wish to only include “high quality” journals has not effectively decreased the number of article retractions. In fact, since mainstream online publications started, the number of retractions has increased.

Revisiting Figures 6 (pathway 6) and 8, another dampening and vicious cycle can be seen. In the process of earning grants, publishing in journals that have PubMed ID numbers is rather important. This is particularly true when renewing or applying for subsequent grants. For an osteopathic physician and/or a PhD researcher at a college of osteopathic medicine, the concern for bias in the peer review journal process in Figure 8 cannot be ignored (the review process for grants has the same problem). Even in a triple-blind peer review process the language used in the osteopathic culture is quite distinct and is not used often outside of the osteopathic community. There then exists an uphill battle for osteopathic researchers significantly greater than that of allopathic researchers. This can lead to failure in renewing or obtaining additional grants secondary to the appearance of decreased or failed “high quality publications.” This issue is compounded with the LSTRC process. The consequences of this insidious cycle have been gleaned in the osteopathic literature before and a call for investigation was voiced. This initial investigation points to simple discrimination (regardless of intent) that has been and continues to be a major force taxing the will of the osteopathic community for many years. Until those in power correct the discrimination, their inaction and neglect allows the suppressive force from the past to continue.

Pattern of regulatory capture
The critical lack of osteopathic representation in the NIH has placed the osteopathic culture and community at a chronically severe disadvantage. When we return to the driving forces behind discrimination and look at the whole picture from the evidence of this investigation, a pattern supportive of intentional actions years ago can be theorized:

1. The need for self-esteem (positive social status from within a group rather than outside a group): the NIH and their FAC has been predominated by allopathic physicians for over 100 years. The development of an NIH organization that had the opportunity to include osteopathic physicians in an initial position of advantage in 1999 was prevented/delayed. The 2-year representation gap/delay occurred during a critical junction in time when the NCCIH organization was first being established (1999-2001, Figure 8). It should be appreciated that it took multiple fields to do almost all of what the osteopathic field has been doing and advocating for since its inception.
2. Status (hierarchies within society): The public started to show interest in osteopathy and other fields besides allopathic medicine. With the potential rise in social status (and even economical) of the osteopathic field came another motivational force for sabotage by neglect. Although legally equal degrees, osteopathic physicians are taught a philosophy and potential practice range that encompasses that of allopathic physicians.

3. Self-interest (preserving resources): $700 billion since 1938 and approximately $30-$40 billion per year is a great deal of resources. The allopathic field is, to a greater degree than the osteopathic field, dependent on salary and indirect cost support in academic training sites. The NIH grants provide this source of support.

The AOA-only programs and colleges of osteopathic medicine have had to develop without or with negligible NIH salary support for more than 125 years. This makes the osteopathic field the most fiscally responsible and lean model for physician training, a fact that needs to be considered given the rising health care costs in general. The dependence on NIH funding to the degree that resource hoarding practices are being displayed by elements of the allopathic field suggests they are in a state of regulatory capture.\(^\text{73-75}\) In brief, regulatory capture is an economic theory that explains the process by which a government regulatory agency created to act in the public’s interest in return promotes the special interests of groups that dominate the industry that it was charged with regulating.

A seemingly perplexing conundrum is that since 1990, the osteopathic field has grown tremendously. The number of COMs and branch campuses, as shown in Figure 8, have increased by over 200% (19 built, now totaling 34 with 35 teaching locations added now totaling 49).\(^\text{76}\) The number of allopathic medical schools and branch campuses has only increased by 19% (24 built, now totaling 151).

Examining Figure 6 can help to explain how the osteopathic community continues to grow with negligible funding from the NIH. Education loans and HRSA grants in pathways 8 and 9 help support medical schools. Laws have already been passed to explicitly direct the inclusion of the osteopathic field in these venues. This was done to stop the in-group favoritism that had been occurring until the mid- to late-1900s.\(^\text{38(p143-161)}\)

Prior to the implementation of the Accreditation Council for Graduate Medical Education’s (ACGME) Single Accreditation System (SAS) transition, the AOA’s residency and fellowship opportunities

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had been increasing.\textsuperscript{77} As indicated in \textit{Figure 6, pathway 7}, Medicare—and to a lesser extent Medicaid—is what helps to fund postgraduate medical education. NIH support at osteopathic predominant training sites (AOA-only) is negligible compared to the support provided to allopathic predominant training sites (ACGME). This fact is cited to be an important and attractive feature for prospective residents and fellows when applying to postgraduate training programs.\textsuperscript{78} The lack of funding has compounded damages to the general public in suburban, rural and underserved areas where a considerable number of osteopathic training sites are located.\textsuperscript{79} This service to the most vulnerable members of our American society is connected to the issues discussed in this paper, but lies beyond the scope of this article.\textsuperscript{58}

The emergence of the SAS came after the ACGME omitted in their common program requirements the AOA-only trained doctors. The omission of AOA-only trained interns and residents effectively made them virtually unable to apply to the federally funded ACGME residency or fellowship programs.\textsuperscript{80,81} One of the requirements to meet ACGME standards for initial and continued accreditation is scholarly activity and PubMed-specific journal publications.

A concern that must be addressed is that the PhD researchers at osteopathic institutions are at potential risk of discrimination by proxy of their association with the field. Only a few PhD researchers at osteopathic medical schools have earned a grant through NCCIH in the past 5 years. PhD researchers at COMs are also absent from all of the 2018 NIH NACs. In general, the NIH grants have been increasing slowly in the past 5 years, but still remain critically low compared to allopathic school counterparts.

Reflection on the past 90 years and the practices that the NIH has displayed through their existence brings about another problem not yet considered. Given that there has been negligible osteopathic representation at the NIH, this makes women and women of minority status in the osteopathic field at the most risk of being disadvantaged in the medical research field. Women in the allopathic field as well seem to be statistically significantly lower than the men of the same field in the NIH branches investigated, but still better represented than males or females in the osteopathic field.

\textbf{Roadmap to Recovery: It’s Always Darkest Before the Dawn}
One of our challenges as a community is to accept that these violations occurred and osteopathic physicians and leadership are not to blame. Working together and making the choice to remedy this injustice will prevent culpability from this point on. In the past, members of the osteopathic community have had to fight for their rights against visible movements from a specific group(s). Sabotage by neglect is different, and invisible omissions without awareness of who, what, when, or where are harder to identify. What would seem like a light-hearted joke in daily life, “it would take an act of Congress to get something done,” is a reoccurring theme throughout osteopathic medicine’s history.\textsuperscript{2,58}

1. A thorough investigation must be conducted. This is the responsibility of the federal government (possibly the Office of the Inspector General and the Federal Trade Commission). They must have the opportunity to act and correct the issue.

2. The osteopathic community needs legal help and guidance to address these issues and to formulate a plan to prevent further violations.

3. The creation of an NIH institute or center for osteopathic medicine with a proper needs assessment is overdue. Additional members of Congress will have to be informed of these concerns and asked to act accordingly. The only way to ensure osteopathic equal opportunity and allow for sustainable contributions to medical research is to form an organization dedicated to the unique recovery needs of the field that actions of the last 125+ years has created. Osteopathic representation must be allowed to reach a critical mass in order to have a sustainable voice and continued contributions in all areas of medical research.

4. Reparations pending investigations are likely to be warranted. The form of which could be an endowment(s) for the NIH institution of osteopathic medicine and other osteopathic organizations that can be used for salary support and critical resources as they appear. The AOA and several osteopathic organizations have given a good faith effort towards investing membership funds to jump-start research and training initiatives in an environment that was seemingly designed to dampen and mitigate those actions.

5. Osteopathic physicians and PhD researchers at colleges of osteopathic medicine need to be protected in the same way that women and minorities are protected for all NIH grant applications regardless of the specific NIH organization.

6. The NLM must back log osteopathic journals and articles into MEDLINE. The inclusion of osteopathic medicine as its own specific subject to be collected comprehensively in the CDM is a must and overdue. If “filtering” is still deemed appropriate, only osteopathic physicians along with non-physician mem-

\textit{(continued on page 25)}
bers of the LSTRC should determine the collection criteria and which journals get into MEDLINE.

7. Consistent applications to all the FACs in the NIH by the osteopathic community (mere interest is enough to apply; one need not be conducting research or applying for grants). One can apply or nominate others by simply emailing your curriculum vitae or resumes as described online at https://ofacp.od.nih.gov/committees/pdf/SelectionCriteria.pdf.

8. The formation of osteopathic think-tanks for public- and government-related issues is warranted. Sitting on Uncle Sam’s left and right shoulders are the same groups that predominate with the allopathic field centered in large institutions. Regulatory capture occurs in environments when there is no opposition.

9. The need for reflection, healing and sustained unity of the osteopathic field is important. How has this affected us as a group and as individuals?63 The lack of identifiable sources of the obstacles thwarting good faith efforts for systemic improvements may have caused us to blame ourselves and our leadership. The AOA and numerous osteopathic organizations have always been the osteopathic community’s strongest advocates and deserving of our membership and reciprocated support.

The osteopathic community has implemented every measure and method of hard work to earn respect and slowly open doors. To this end, we have come a long way in the public’s favor as well as in the clinical medical community in general. This lasting barrier of exclusion will need a unified osteopathic force to dispel it permanently.

**Conclusion**

New evidence supportive of chronic discrimination through sabotage by neglect of the osteopathic culture and community has been uncovered. A thorough investigation is warranted to verify concerns noted in this preliminary investigation of public records. Although intent cannot be determined, until those in power correct the discrimination, their inaction and neglect allows the suppressive forces from the past to continue. Extreme corrective actions are likely needed with damages accessed.

Progress in the SAS process may need to be suspended/extended until critical access to resources are created and a plan moving forward is formed. The osteopathic community has displayed amazing resilience and resourcefulness in the face of a $700 billion disadvantage and unsupportive federal scholarly and academic environment; imagine what it can do in a supportive one.

**References**


19. National Advisory Council for Complementary and Alternative Medicine Minutes of the Thirty-First Meeting September 12,

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Osteopathic Manipulation Improves Functional Status in Patients With Non-Specific Chronic Back Pain in a Rural Outpatient Setting

Daniel J. Wilson, PhD; Jennie L. Gorham, DO, FAAPMR, FAAPM; Teri Lamb, RN; Shanliang Lui, MD, FAAPM, FAAPMR; and Todd Daniel, PhD

Abstract

Context
Osteopathic manipulative treatment (OMT) is a widely used methodology for the clinical treatment of spine-related pain. Recent reports have been especially positive regarding the use of OMT for chronic back pain. However, published reports have been focused on populations available within large university-based institutions, with rural-based hospitals and their clientele unrepresented within the professional literature.

Objective
The objective of this multi-year study was to examine the effects of OMT on spine-related chronic pain and its effects on dimensions of functional ability in a rural setting served by a safety-net hospital.

Methods
In this study, 151 participants with chronic (>6 months) spine-related pain (mean age 54.58 ± 11.88 years) completed at least 2 office visits. The Oswestry Disability Index (ODI) was used to assess 10 dimensions (pain intensity, personal care, lifting, walking, sitting, sleeping, standing, sex life, social life, and travel) and a total score of functional ability related to back pain.

Results
A 2-way mixed-model, repeated-measures analysis of variance (ANOVA) with time (pre- and post-office visit) as the within-participants factor and with sex as the between-participants factor resulted in a significant main effect from pretest to posttest, \(F(1,149) = 67.12, P < .001, \eta^2_p = .311\), but not a significant interaction between time and gender, \(F(1,149) = .426, P = .515, \eta^2_p = .003\).

Conclusions
The results of this study support the hypothesis that OMT improved measures of functional ability related to pain intensity, unrelated to sex. The rural nature of the clinical setting provided a unique population for this study.

Key words
Chronic pain, rural, OMT, Oswestry Disability Index

Introduction
A reported one-third of clinical visits in the United States for chronic pain conditions are to osteopathic physicians,1 prompting medical researchers to increase the focus on the efficacy of osteopathic manipulative treatment (OMT) as a treatment for a variety of chronic pain conditions. Published reports2,3 have provided positive support for the use of OMT as a modality for the relief of chronic pain, primarily low back pain. This is evidenced by the largest single-site efficacy trial of spinal manipulation conducted for low back pain, completed in 2011 and enrolling 455 participants.4
The purpose of this study was to determine the effects of OMT on spinal-region chronic pain in a rural population. To measure functional aspects of everyday life related to chronic pain, the Oswestry Disability Index (ODI) was used to determine changes in a variety of life activities affected by chronic pain. The hypothesis tested was that OMT results in increased functional status following a 6-month plateau of no improvement in recovery from chronic pain. A secondary objective was to determine if the sex of participants may play a role in increased functional status of patients with chronic back pain following OMT.

**Methods**

**Participants and Setting**

The study was conducted at a rural safety-net hospital. A safety-net network consists of “…hospitals and other providers that organize and deliver a significant level of health care and other health-related services as providers of last resort.” Participants represented an underserved 5-county area of primarily lower socio-economic status. Inclusion in this study was on a voluntary basis during an 11-year period, ranging from February 2001 to December 2011. Institutional review board approval was obtained prior to the study, and it was renewed annually during the study duration. Potential participants as identified by a rural outpatient physician met the criterion that they had self-reported chronic pain (>6 months and up to several years) that had not been resolved with their current medical care. Patients with non-spinal pain or acute pain were excluded. Patients with serious medical conditions such as cancer, myocardial infarction, neuromuscular diseases, alcohol and drug abuse and known psychological illness also were excluded from this trial.

A total of 263 potential participants were pre-screened during the initial clinical visit with non-specific spinal-region chronic pain of at least 6 months in duration between 2001 and 2011. From this sample, 151 participants completed 2 office visits with data collection (dropout rate 42.6%). The most common reason for dropout was an inability to schedule a follow-up visit with the patient. Since the patients were pre-screened before the initial clinical visit, dropout was not due to any of the exclusion factors, but either a lack of willingness to continue the study, or unknown external factors.

**Outcomes**

The Oswestry Disability Index is a self-completed questionnaire measuring 10 dimensions of quality of life: pain intensity, lifting, ability to care for oneself, ability to walk, ability to sit, ability to stand, social life, sexual function, sleep quality, and ability to travel. Each dimension is followed by 6 statements scored from 0 (no pain or disability) to 5 (the worst pain imaginable or complete disability). Scores from 0 to 6 (0%-20% of the total) are interpreted as minimal disability. Participants reporting scores of 25 and higher (81%-100%) are assumed to be either bed-bound or exaggerating their symptoms. The ODI has been shown to be a valid and reliable instrument for assessing back-specific disability and function.

**Randomization and Treatment**

**History Effects**

Use of a control group was not possible due to restrictions on physician time and facilities and the inability to deny treatment. In the absence of a control group, it was important to evaluate whether possible improvements noted over time could be explained by variation not due to the experiment. If improvements would have occurred in the absence of treatment, we would expect to find differences between groups based upon when they enrolled in the study. Patients were enrolled in the study at their initial clinical visit, a rolling timeline during the first year of the study.

Patients were divided into 4 groups based on the timing of the initial clinical visit (0-3 months; 4-6 months; 7-9 months; and 10-12 months), and possible natural history effects were examined using one-way analysis of variance (ANOVA) partial-lag design. Regardless of when patients enrolled in the study, they did not differ at their baseline ($F (3,147) = 1.87, P = .137$) or second clinical visit ($F (3, 55) = 2.20, P = .098$). Examination of the corresponding line plots (see Figure) showed that the 4 starting groups differed in the same pattern across the 2 clinical visits and that they improved in the same pattern. These findings suggest that patients with stable chronic pain levels do not begin to improve without treat-
ment, improve along the same trajectory once treated, and that any improvements noted were due to the effects of the treatment not to history effects or random variation.

Treatment
The study physician was a licensed osteopathic physician, board-certified in physical medicine and rehabilitation and interventional pain management. OMT was applied to the body areas the physician determined to be related to the chronic pain, and thus was individualized similar to the protocol described by Andersson et al.12 Treatments included no high-velocity, low-amplitude movements. Osteopathic manipulation techniques included myofascial release, cranial/sacral manipulation, counterstrain techniques, muscle energy, and visceral manipulation among others. The one exclusion to treatment was the introduction of narcotics during the study period. Initial clinical visits were 60 minutes each with 1 follow-up visit per participant of 30 minutes.

There were a number of OMT techniques employed depending on the underlying cause of the chronic pain diagnosed. These methods included cranial manipulation, myofascial release, counterstrain, and muscle energy techniques.

Statistical Analysis
All numerical subscales of the Oswestry Disability Index were summarized as means ± standard deviation. Although the ODI is measured in a Likert, non-parametric scale, due to the 5-point nature of each subscale, the data was able to be treated as parametric.13 A two-way, mixed-model, repeated-measures ANOVA with time (pre-treatment and post-treatment) as the within-participants factor and sex (male and female) as the between-participants factor was used to determine overall effects of OMT on indicators of quality of life as determined by the ODI. All statistical design and testing was determined in consultation with the RStats Institute of Missouri State University.

Results
A total of 151 participants, 57 men and 94 women aged 28 to 87 years, were enrolled between 2001 and 2011 in the rural sample (see Table 1). The mean age for the 2 groups was nearly identical: male, 53.1 ± 9.3 years; female, 53.1 ± 11.5 years. Pre- and post-treatment Oswestry sub scores are given in Table 2. The male group reported slightly higher total ODI scores at the initial visit (26.23 ± 7.21 vs. 25.28 ± 8.36) (see Table 3).

The first research question asked whether the intervention improved functional ability, and a secondary research question asked whether a sex difference existed between men and women on total ODI scores. A two-way, mixed-model, repeated-measures ANOVA with pre- and post-treatment as the within variable and sex as the between-participants variable showed a significant main effect from pretest to posttest, \( (F(1,149) = 67.12, P < .001, \eta_p^2 = .311) \), but not a significant interaction between time and sex, \( (F(1,149) = .426, P = .515, \eta_p^2 = .003) \). These findings indicated that while the intervention was associated with an increase in functional ability as measured by decreases in ODI scores, patterns of change did not differ between male and female participants, functionally ruling out a sex difference in total ODI scores.

Cohen’s \( d \), defined as the difference between the means divided by the standard deviation, was calculated for pre- and post-treatment score differences to aid in the interpretation of each sub-scale of the ODI. The largest effect size was for the total of the 5 dimensions of...
The purpose of this study was to determine the effects of osteopathic manipulative treatment on spinal-region chronic pain in a rural population. The hypothesis tested was that OMT results in increased functional status following a 6-month plateau of no improvement in recovery from chronic pain. Following OMT, a statistical increase in self-reported functional ability was found in patients who had experienced at least 6 months of chronic back pain. No statistical differences were found between the sexes in their functional improvement.

The study design allowed for testing history effects, or natural recovery effects, prior to the first clinical visit that may have existed due to the rolling admission to the study. Natural history effects were found to be non-significant (see Methods section), prior to first data collection. Therefore, the rolling admission into the study made no difference, and pretreatment scores were not affected by time prior to initial visit.

Attributing increases in functional status with chronic pain to OMT is complicated due to the lack of the use of a placebo or non-treatment group. Andersson et al pointed out that it is not possible to prevent patients with back pain from initiating self-care (using activity or medication), making the use of a true non-treatment group difficult to control. Thus, the statistical increases in functional status found following OMT in this study cannot be directly attributed to the clinical treatment. However, numerous studies have reported that recovery rate from chronic pain is slower after the initial 3 weeks than before. In addition, most studies of spinal-region pain have focused on the acute-phase, the first 2 to 4 weeks. Most patients will have a natural recovery from their pain during this time period without the use of manual therapy, but studies have documented the benefit of OMT during this period, primarily in the rate of recovery. Thus, reduced pain levels and increases in functional status during the chronic pain stage, especially following a documented plateau in pain levels, is not expected during the natural course of recovery.

**Table 1. Participant demographic data.**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>57</td>
<td>94</td>
<td>151</td>
</tr>
<tr>
<td>Age (M ± SD)</td>
<td>54.51 ± 10.35</td>
<td>54.45 ± 12.66</td>
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</tr>
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</table>

**Table 2. Oswestry Disability Index sub scores and totals**

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Post</th>
<th>Effect size*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain intensity</td>
<td>2.84 ± 0.90</td>
<td>2.67 ± 0.89</td>
<td>0.15</td>
</tr>
<tr>
<td>Personal care</td>
<td>1.70 ± 1.17</td>
<td>1.43 ± 0.95</td>
<td>0.26</td>
</tr>
<tr>
<td>Lifting</td>
<td>3.28 ± 1.12</td>
<td>2.97 ± 1.11</td>
<td>0.28</td>
</tr>
<tr>
<td>Walking</td>
<td>2.25 ± 1.28</td>
<td>1.91 ± 1.32</td>
<td>0.29</td>
</tr>
<tr>
<td>Sitting</td>
<td>2.44 ± 1.02</td>
<td>2.10 ± 1.03</td>
<td>0.33</td>
</tr>
<tr>
<td>Standing</td>
<td>2.97 ± 1.23</td>
<td>2.60 ± 1.06</td>
<td>0.36</td>
</tr>
<tr>
<td>Sleeping</td>
<td>2.40 ± 1.07</td>
<td>2.15 ± 1.12</td>
<td>0.24</td>
</tr>
<tr>
<td>Sex life</td>
<td>2.42 ± 1.78</td>
<td>1.93 ± 1.72</td>
<td>0.30</td>
</tr>
<tr>
<td>Social life</td>
<td>2.67 ± 1.27</td>
<td>2.33 ± 1.32</td>
<td>0.29</td>
</tr>
<tr>
<td>Travel</td>
<td>2.46 ± 1.15</td>
<td>2.33 ± 1.60</td>
<td>0.08</td>
</tr>
<tr>
<td>TOTAL</td>
<td>25.63 ± 7.93</td>
<td>22.29 ± 8.11</td>
<td>0.68</td>
</tr>
</tbody>
</table>

*Effect size is reported as Cohen’s d, defined as the difference between the means divided by the standard deviation.

**Table 3. Oswestry Disability Index scores by sex.**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Pain intensity</td>
<td>2.89 ± 0.90</td>
<td>2.74 ± 0.77</td>
<td>2.81 ± 0.91</td>
<td>2.63 ± 0.96</td>
</tr>
<tr>
<td>Personal care</td>
<td>1.70 ± 1.15</td>
<td>1.40 ± 0.86</td>
<td>1.69 ± 1.19</td>
<td>1.45 ± 1.00</td>
</tr>
<tr>
<td>Lifting</td>
<td>3.16 ± 1.08</td>
<td>2.81 ± 1.21</td>
<td>3.35 ± 1.13</td>
<td>3.07 ± 1.06</td>
</tr>
<tr>
<td>Walking</td>
<td>2.18 ± 1.27</td>
<td>1.81 ± 1.34</td>
<td>2.30 ± 1.29</td>
<td>1.98 ± 1.30</td>
</tr>
<tr>
<td>Sitting</td>
<td>2.42 ± 0.80</td>
<td>2.18 ± 0.97</td>
<td>2.45 ± 1.13</td>
<td>2.05 ± 1.07</td>
</tr>
<tr>
<td>Standing</td>
<td>3.00 ± 1.23</td>
<td>2.47 ± 1.00</td>
<td>2.96 ± 1.24</td>
<td>2.67 ± 1.09</td>
</tr>
<tr>
<td>Sleeping</td>
<td>2.35 ± 1.03</td>
<td>2.23 ± 1.07</td>
<td>2.43 ± 1.09</td>
<td>2.11 ± 1.16</td>
</tr>
<tr>
<td>Sex life</td>
<td>2.81 ± 1.71</td>
<td>2.11 ± 1.71</td>
<td>2.18 ± 1.80</td>
<td>1.83 ± 1.72</td>
</tr>
<tr>
<td>Social life</td>
<td>2.81 ± 1.20</td>
<td>2.33 ± 1.20</td>
<td>2.59 ± 1.31</td>
<td>2.33 ± 1.39</td>
</tr>
<tr>
<td>Travel</td>
<td>2.58 ± 0.98</td>
<td>2.30 ± 1.03</td>
<td>2.38 ± 1.24</td>
<td>2.35 ± 1.86</td>
</tr>
<tr>
<td>TOTAL</td>
<td>26.23 ± 7.21</td>
<td>22.51 ± 7.71</td>
<td>25.28 ± 8.36</td>
<td>22.11 ± 8.38</td>
</tr>
</tbody>
</table>

(continued from page 31)

functional status (0.68), which was interpreted as a medium effect by Cohen.

**Discussion**

The purpose of this study was to determine the effects of osteopathic manipulative treatment on spinal-region chronic pain in a rural population. The hypothesis tested was that OMT results in increased functional status following a 6-month plateau of no improvement in recovery from chronic pain. Following OMT, a statistical increase in self-reported functional ability was found in patients who had experienced at least 6 months of chronic back pain. No statistical differences were found between the sexes in their functional improvement.

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Study Limitations

The primary limitation of this study design, as previously discussed, was the lack of a true control group. In this study, each patient served as their own control by demonstrating a lack of pain intensity recovery over a 6-month period despite conventional medical treatment.

A second limitation often cited in research literature is the lack of cost of medical treatment documentation. It has been reported that the frequency of medical visits is greater when patients are receiving OMT as opposed to standard allopathic care.\(^{21,22}\) An increase in medical visits could introduce its own placebo effect, but this is not relevant to this study as the number of visits were identical. Documenting medical costs, however, may provide additional evidence of the benefits associated with OMT.

Conclusion

Osteopathic manipulation is used to treat a variety of medical conditions including back-related pain. This study reported that the use of these techniques applied to a rural population of patients resulted in significant improvement in functional status in a variety of activities despite a previous plateau in both level of pain and functional status.

References

Teaching Osteopathic Principles and Practices: Easy as ABCs

Victor Nuño, DO; Nicole Jeanine Peña, DO; Trista N.F. Hughes, OMS IV, MPH; Lee Ann M. Cuny, DO; and Stacey L. Pierce-Talsma, DO, MS-EdL, FNAOME

Background
The use of osteopathic manipulative treatment (OMT) among osteopathic physicians in clinical practice has demonstrated decline. Early in their education, osteopathic medical students learned the foundational tenets and the philosophic considerations, and they practiced hands-on techniques. Upon reaching their clinical rotations, however, student application of osteopathic principles and practices (OPP) and osteopathic structural examinations (OSE) are often omitted. The choice to not use osteopathic principles or to not complete an OSE is likely multifactorial, including lack of preceptor role modeling and confidence in ability. Attending physician time and support also may be significant contributing factors. An additional consideration may be a lack of a clinical osteopathic framework for students and faculty to easily consider principles in any patient or disease process and allow preceptors a lens through which to observe student osteopathic rationale.

This article will describe an approach that aims to increase the usage of OMT in clinical practice and the ease of precepting osteopathic students by providing a clear and concise clinical osteopathic framework for students and faculty to quickly integrate osteopathic principles into any patient encounter.

Introducing the ABCs
There are various paradigms used in the evaluation and management of patients with osteopathic principles and OMT, including the 5 classic treatment models described in Foundations of Osteopathic Medicine: biomechanical, respiratory-circulatory, metabolic, neurologic, and behavioral. These classic models represent an excellent framework to consider health and disease and the relationship to somatic dysfunction. While the individual models are helpful for building an osteopathic understanding, a truly holistic osteopathic assessment would include all models in a single patient encounter. To encourage this type of whole-person consideration, students may benefit from having an easily recalled, simple construct around which they can begin to form their osteopathic prescription.

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Students often use mnemonic devices to help them to recall and organize information. Mnemonic devices have some evidence of efficacy in medical and nursing education; specifically, they have been shown to connect recent with existing knowledge, facilitate and expedite the construction of meaning by creating multiple links between the information, and distribute functional brain organization to enable superior memory performance. Utilizing a mnemonic may provide students with a superior ability to recall and apply their osteopathic knowledge to any case, even challenging or unfamiliar ones.

To meet the challenges students face utilizing OMT in their clinical training, we present “The ABCs of Osteopathic Medicine.” A represents autonmics (both parasympathetic and sympathetic); B represents biomechanics (noted restriction of any regional joints, muscles, fascia); C represents circulation (incorporating considerations of lymphatic, venous and arterial circulation); and S repre-
(continued from page 34)

sents screening (consideration of global influences, as well as mind, body, spirit factors).

Autonomics
The autonomic nervous system (ANS) plays a vital role in health and disease.\(^3\) A facilitated state of the ANS, often referred to as central sensitization, alters homeostasis and is known to worsen many medical conditions.\(^6\) Deleterious effects include altered immune function, alterations in vascular and lymphatic flow, and increased perception of pain among others.\(^2\) Viscerosomatic reflexes may occur as inflamed organ tissues transmit nociception to the spinal cord, creating facilitation at particular spinal segments or regions. These segments may become further facilitated from dysfunction in somatic structures.

Osteopathic manipulative treatment of the somatic dysfunction appears to modulate this neurologic feedback loop, possibly the result of both an anti-inflammatory and parasympathetic effect.\(^2\) Recognizing the importance of balancing the autonomies, both parasympathetic and sympathetic, by focusing on the diagnosis and treatment of clinically relevant regions allows the student to provide a therapeutic physiologic effect for any patient complaint.

Biomechanics
Osteopathic philosophy has long held that the body is a unit and that structure and function are reciprocally interrelated.\(^4\) When evaluating any patient complaint, consideration should be given to the various aspects of TART (tissue texture abnormality, asymmetry, restriction of motion, and tenderness) in the surrounding bones, joints, muscles, tendons, ligaments, and fascia. Biomechanical restrictions may lead to alteration of normal ranges of motion, or cause compensation in other regions. Students are encouraged to assess key areas related to a patient’s chief complaint as well as those directly adjacent to these areas. One example of this concept may include biomechanical respiration where adequate motion of the ribs, diaphragm, and thoracic spine are necessary for appropriate aeration of the lungs.

Circulation
Optimal health relies on fluid movement to bring nourishment, remove waste products, and stimulate immune function. As students consider a patient’s complaint, they should screen the musculoskeletal system for areas that may impede arterial, venous, or lymphatic flow. For all patients, this would include assessment of both the thoracic inlet and the thoracoabdominal diaphragm, representing the terminal endpoint of lymphatic drainage and the major pump of venous and lymphatic fluids in our bodies. Additional assessment might include any of the other transverse diaphragms, or anatomic regions where the circulatory or lymphatic flow may be impeded by TART changes in the musculoskeletal system as it relates to the patient’s complaint.

Screening
The screening exam encourages global consideration of the patient, beyond the more obvious chief complaint or the specific region of dysfunction. The astute practitioner is one who is able to think not only of the most obvious causes for a patient’s issue but is also able to capture the subtler variations in patient presentations. Students may use any screening tool such as postural analysis, gait, passive range of motion, fascial pull, or a Zink screen. Students should consider a patient’s trauma history and old somatic dysfunction that may be contributing to the current complaint. Additionally, students should assess for any environmental, psychological, or spiritual issues contributing to the person’s overall health.

Questions a student may consider include: Is my patient getting enough rest and proper nutrition? What is their vitality like? Do they have the personal, mental, and spiritual components necessary to feel supported in overcoming or adapting to their illness?

The screen is a reminder to assess the whole patient, globally, from top to bottom, including the mind, body, and spirit while recognizing that each person is an individual.

Goals of the ABCs
This framework is not intended to provide an algorithm or stepwise protocol, but it is a tool for students to recall osteopathic considerations relevant to the evaluation and treatment of patients and to promote the patient’s health in every interaction. Our goal is to simplify concepts and emphasize the thought process one may use during an OSE and selection of relevant body areas to diagnose any somatic dysfunctions to treat. We acknowledge that the diagnosis and treatment of patients utilizing osteopathic philosophy goes far beyond what we have listed in the ABCs, but giving the student a clear framework on top of which they can build their clinical experience may allow more students to incorporate OSE and OMT into their daily patient care.

Use of this framework for understanding and integrating OPP into medical training may benefit many, from students and patients to residents and preceptors. First- and second-year students will use the ABCs as a roadmap when addressing the osteopathic diagnosis and treatment of disease processes, body areas, or novel clinical situations they have yet to learn about. Third- and fourth-year students will use the ABCs to develop an appropriate diagnosis and treatment plan, providing them with a physiologic framework to

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discuss with their attendings (both DOs and MDs) in the clinical setting.

At all levels of training, the ABCs provide a framework, based in anatomy and physiology, to engage in scholarly discussion with attending physicians, including those unfamiliar with osteopathic principles. The ABCs may be an easy place for our MD colleagues to enter into the discussion of osteopathic principles as they precept and evaluate our students. By utilizing these concepts, one should have the ability to provide rational justifications for assessing and treating a given area of the body, particularly when a body region may seem unrelated or distant to the patient’s chief complaint. Ultimately, this approach will benefit the patient by resulting in the students’ ability to develop a truly holistic and integrated osteopathic treatment plan focused on the body’s innate ability to heal and the inner health of each patient.

**ABCs in Practice**

We have begun to implement the ABCs of osteopathic medicine in our curriculum here at Touro University California – College of Osteopathic Medicine (TUCCOM). During their first semester, the students get a handout overview that introduces them to the concept. After this introduction, we refer to the concept during their formative lectures on autonomics (Facilitation and Autonomic Function), biomechanics (Structural Exam 1-5, Kinesiology, Facet Diagnosis), circulation (Osteopathic Approach to Lymphatics and Upper Respiratory Infections), and screening (Structural Exam 1-5, Mitchell Model, Zink). These foundational labs build to applied clinical labs in which students are presented with clinical cases and must practice integrated osteopathic exams. These labs span the first 2 years of OPP curriculum. During these clinical labs, the approach to the patient is discussed through the lens of the ABCs as students integrate osteopathic diagnosis and treatment skills in a clinical scenario. Students also are required to discuss the ABCs related to the patient’s care in their written SOAP notes.

Students participate in COAR (clinical skills, OPP, anatomy, radiology) case-based sessions which integrate basic sciences, osteopathic doctoring, and osteopathic principles and practices. In each session, all facilitators for each section weave in ABCs concepts and learning points as they are based in anatomic and physiologic concepts.

Faculty preceptors use the ABCs in student clinics to assist students with their osteopathic prescription: when to apply OMT, where to assess and apply OMT, why these treatments should be used. The ABCs can be used as a guidepost for DO and MD faculty alike to begin to assess the students’ rationale behind their motives to use OMT. Additionally, it assists students in new clinical settings to move beyond using techniques to true use of osteopathic principles.

During the third year, students continue to have reinforcement of the ABCs during osteopathic e-conferences, COAR sessions, a SOAP note assignment, and one callback session. E-conferences and COAR allow for further student growth and understanding osteopathic principles through a deeper dive into the clinical relevant anatomy and physiology in the context of the ABCs. The SOAP note and callback session allow for formative assessment of their thought processes and formative development in the application of the ABCs. We plan to include the ABCs in our curriculum development for our fourth-year students, and we hope to include a summative assessment as a demonstration of their competency and entrustability in the application of osteopathic principles.

**Evaluating the ABCs’ Utility**

Beginning Spring 2018, we have begun to assess the usefulness of the ABCs model to identify if it assists students in organizing their osteopathic rationale and applying principles to novel clinical scenarios. To that end, we plan to add 2 unique components to do this: a survey and a basic skills assessment. Students are surveyed during their third-year callback where the included questions assess student comfort with utilizing OMT in the clinical setting and identifying how much OMT has been utilized on core rotations. We will add these 2 questions to the survey:

1. Did the ABCs of osteopathic medicine provide you with a useful framework to discuss OMT with your preceptor?
2. Do you feel that the ABCs of osteopathic medicine enabled you to utilize OMT in novel clinical situations in which you might not have otherwise been comfortable utilizing OMT?

Additionally, we will be adding a basic skills assessment (BSA) to measure the utility of the ABCs. The BSAs are low stakes assessments where students have a list of specified criteria to accomplish in a one-to-one faculty-to-student ratio. They must either pass or re-take until they pass. This format gives the students one-on-one feedback that is personalized to the unique struggles they may be having with the material, and it allows them to remediate any identified deficiencies before the formal exam.

BSAs typically focus on proficiency in techniques. This new BSA would assess the students’ ability to perform a clinically relevant and efficient OSE for a clinical condition in a body system they have not yet covered. The rubric will assess how well their OSE satisfies components from each of the 4 aspects of the ABCs. In this way, we will be able to move from providing formative feedback in...
techniques only to assessment of students’ rationale and application of principles in patient care.

Finally, the ABCs concept has been included in faculty development. Utilization of the ABCs has allowed us to engage our basic science colleagues to inform them of the language and importance of anatomic and physiologic principles in the practice of osteopathic medicine as we work toward better integration. We have included the ABCs in faculty development programs for our clinical faculty that allow them to precept and assess our students in the domains of osteopathic principles and practices, student rationale, and osteopathic critical thinking.

We plan to track outcomes including student use and comfort with using OMT via the third-year callback survey that all third-year students complete and the AACOM survey that all graduating students must take. Via these instruments, we hope to see more clinical students reporting the ability to use OMT while on clinical rotations. This could be due to either aspect of the ABCs implementation, faculty that have an improved ability to understand concepts and allow students to use OMT, or students who have improved understanding and communication skills rendering them better able to discuss their osteopathic rationale in terms of anatomy, physiology, and holistic patient care.

Conclusion

Using the ABCs mnemonic to recall assessment of the autonolics, biomechanics, circulation, and screening exam for each patient may aid in the usage of OMT in clinical practice. The ABCs do not seek to replace or minimize any aspect of osteopathic medical education, but rather serve as a framework for both the organization of information to be presented to students as well as to enable recall of material from students when faced with novel clinical scenarios. Our goal in providing students and preceptors with this framework is to increase the overall usage of OMT in clinical practice, to aid in the usage of OMT in clinical practice, to aid in the usage of OMT in clinical practice.

References

2. Chamberlain NR, Yates HA. A prospective study of osteopathic medical students’ attitudes toward use of osteopathic manipulative treat-
19. Drummond PD. Sensory disturbances in complex regional pain syndrome: clinical observations, autonomic interactions, and pos-


Osteopathic Evaluation and Post-Surgical Rehabilitation Approach in a Patient With Myelopathy and Tetraparesis Related to Cervical Ependymoma: A Case Report

Drew D. Lewis, DO, FAAO, FNAOME, FAOCPMR, FAAPMR

Abstract
Neck pain with associated upper limb symptomatology presents commonly in primary care, musculoskeletal specialty, and osteopathic manipulative medicine (OMM) clinics. Thorough evaluation to determine the presence of red flags prior to providing treatment is a prerequisite for OMM providers.

In the present case report, a 48-year-old right-hand-dominant woman with chronic neck pain and weakness in the left arm was found to have cervical myelopathy due to intramedullary ependymoma. Urgent surgical consultation facilitated appropriate spinal decompression followed by in-patient rehabilitation.

To the author’s knowledge, this is the first case reported involving the use of osteopathic manipulative treatment (OMT) in the sub-acute rehabilitation phase following spinal cord tumor surgical decompression.

Background
Cervical myelopathy, or compression or injury of the spinal cord, may be suspected in patients presenting with paresthesias in the upper and/or lower limbs; changes in gait or balance; and loss of agility with their hands; bowel or bladder retention or incontinence; or sexual dysfunction.1-2 Up to 50% of patients with myelopathy will not present with neck pain, which can lead to a delay in diagnosis.3

Classic findings include weakness, spasticity, and gait abnormalities. Differential diagnosis includes degenerative (spondylitic) changes of the spine, epidural abscess, syringomyelia, multiple sclerosis, amyotrophic lateral sclerosis, intracranial pathology, and spinal cord tumors.2,3

Optimal management of spinal cord ependymomas involves total surgical resection when possible but can carry a significant risk of morbidity.4,5 An alternate to surgical resection is surgical decompression. Radiation therapy may also be used as an adjuvant, and less frequently, treatment may involve observation.4,5

From the Des Moines University College of Osteopathic Medicine in Iowa.

Financial disclosures: none reported.

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Submitted for publication April 24, 2017; final revision received April 19, 2018; manuscript accepted for publication April 19, 2018.

Dr Lewis prepared this manuscript as one of the requirements to earn fellowship in the American Academy of Osteopathy. The Committee on Fellowship in the AAO provided peer reviewing for this article, and it was edited to conform to the AAOJ’s style guidelines.

Postoperative outcomes vary with some improved or no change with their pre-operative status and some with increased neurologic deficits consistent with spinal cord injury.5 Studies point to pre-operative neurologic status as a significant prognostic factor in the postoperative neurologic status.5

This case examines how the use of a routine, pre-OMT neurologic screening examination can effectively identify patients who have concerning neurologic conditions such as cervical myelopathy. In addition, this case demonstrates how OMT can be utilized to facilitate the postoperative rehabilitation of patients who have cervical myelopathy.

(continued on page 40)
Report of Case

History
A 48-year-old right-hand-dominant woman with osteoarthritis of the neck and prior diagnosis of fibromyalgia presented to the OMM clinic with a 5-year history of neck pain and weakness in the left arm. She rated this pain a 4 out of 10 on a pain scale, where 0 is no pain at all and 10 is worst pain imaginable. She described the pain as dull, aching, and throbbing with pressure located on the left greater than right side of the neck and at the back side of the left arm by the axilla (see Figure 1). She reported pain was present most of the time, and in addition, there was a feeling of weakness and fatigue in the entire arm (see Figure 1).

The patient denied nocturnal paresthesias, and flick sign was absent. Aggravation of symptoms came with standing, walking, exercising, or lifting. She reported relief when lying on her right side or back. She reported no injury to explain her symptoms.

Functional impairments included difficulty with dressing in a swimsuit for water aerobics. The patient avoided biking, walking for exercise, and yard work. She works as a legal secretary and required assistance with lifting heavy files. She modified house chores to only using the right hand to lift or clean. She modified her sleep habits by lying on her right side or back to reduce pain. She modified her dress habits as she could not snap her bra on her back, and it was harder to put on her clothes. It also was harder to wash her hair with her left arm. When asked her goal for our encounter, she stated she was seeking proper diagnosis and pain relief.

Medical history was significant for depression and sinus headaches. The patient reported overactive bladder and feeling light-headed with orthostatic postural change, possibly related to low blood sugar episodes. She denied trauma to the cervical spine or head with no history of concussion, whiplash, or other motor vehicle collisions.

Physical Examination
On physical examination, the patient’s blood pressure was 120/70 mm/HG; pulse was 84 beats per minute; respirations were 16 per minute; height was 69 inches; and weight was 275 lbs.

Upon cognitive examination, the patient was alert, oriented, and in no acute distress. She followed commands without difficulty. Mood and affect were appropriate, and she was well groomed. Language was normal in fluency, content, context, intelligibility, and response latency. Cranial nerves were grossly intact, including extraocular muscles full without evidence of nystagmus. Head was normocephalic and atraumatic. Gait was mildly slow but without assistive devices and no ataxia or imbalance was appreciated.

A modified American Spinal Cord Injury Association (ASIA) neurologic examination revealed Hoffman’s sign positive in the bilateral upper limbs. Plantar response (Babinski) was downgoing on the right and upgoing on the left. Clonus in the ankle was 3 beats on the right and 3 to 4 beats on the left. Deep tendon reflexes were 1/4 in the right upper limb, absent (0/4) in the left biceps and brachioradialis, and 2+/4 in the left triceps. Lower limb revealed 3/4 reflexes in the bilateral patella and left Achilles, with 2+/4 right Achilles response.

Sensation was abnormal, with decreased light touch in the C4 dermatome on the left, decreased pinprick in the left C4, bilateral C5 and C6, right C8, and right T1. Pinprick was also decreased in the right L2, L4, L5, and S2; and increased in the right S2 dermatomes.

Motor exam revealed profound weakness in all left upper limb muscles assessed, including 3/5 strength in elbow flexion (C5), elbow extension (C7), and wrist extension (C6). Weakness also was noted in left hip flexors (4/5), otherwise full strength in the lower limbs. The patient did have reduced range of motion of the left shoulder with active abduction limited to 90 degrees, which restricted internal rotation with extension and limited her ability to reach for her bra. Examination revealed atrophy of the left forearm.
and fasciculations in the left deltoid region. Further structural exam was limited on initial visit due to time constraints.

On the day of the initial visit, plain films of the cervical spine obtained in the office revealed slight anterior displacement of C5 relative to C6 with flexion without instability on flexion and extension views. No other bony abnormalities were found.

**Diagnosis**

Based on the profound left upper extremity motor weakness, sensory loss, and hyper- and hyporeflexia in the upper and lower limbs, the impression was a possible upper motor neuron lesion syndrome involving the cervical spine or brain.

Magnetic resonance imaging of the cervical spine was performed 4 days after the initial visit. It showed a large intramedullary non-enhancing mass within the cervical spine extending from C2 to C7 with a low-grade neoplasm suspected (see Figure 2). A syrinx (syringomyelia) was felt to be less likely based on signal patterns. MRI of the brain was without any gross deficits.

Five days after the initial visit, the patient was seen in consultation by a local neurosurgeon. The intramedullary tumor was diagnosed as an ependymoma from the foramen magnum to C7, causing cervical myelopathy and tetraparesis. Considering the size and type of tumor, the patient was referred to the Mayo Clinic in Rochester, Minnesota, for definitive treatment. Within 1 month of diagnosis, she had undergone cervical decompressive laminectomy and autograft fusion.

**Figure 2.** Sagittal MRI demonstrating intramedullary tumor from C2 to C7.

**Follow-up Treatment**

The patient returned approximately 7 months later after transitioning from inpatient rehabilitation in Rochester to a local skilled nursing facility. Postoperatively, she developed increased weakness, especially in the left upper and lower limb. Owing to her difficulty with walking related to weakness and increased tone in the left lower limb, she utilized an ankle foot orthosis and a walker for short distance ambulation. She utilized a power chair for long distance community mobility. Her walking was impaired due to increased tone in her ankle plantar-flexor muscles.

On the osteopathic structural exam, counterstrain tender points were addressed in the patient’s left soleus, tibialis anterior, semimembranosus and semitendinosus. Oral baclofen was increased to 20mg 3 times per day for better management of the spasticity in her lower limb.

Through the rehabilitation process, the patient also described symptoms of neck pain, restricted motion, and headache. Considering the patient’s cervical tumor and myelopathy status post–cervical laminectomy.
(continued from page 41)
cal fusion, indirect approaches were utilized to resolve both myofascial strains and articular restrictions and to reduce the hypertonicity related to her upper motor neuron spasticity. Somatic dysfunction of the occipitoatlantal joint was addressed with indirect myofascial release; posterior cervical muscle tension was addressed with facilitated positional release; upper trapezius, levator scapula, and sternocleidomastoid tender points were addressed with counterstrain; and cervical segmental and thoracic inlet dysfunctions were addressed with Still principles.7

Persistent neuropathic pain remained a challenge throughout the patient’s recovery. The burning in the left upper quarter became more focal to the upper arm and upper thoracic region approximately 8 and a half months after surgery (see Figure 3). Weakness of the left arm persisted as well as neuropathic pain and spasticity in the distal lower limbs. Gabapentin was prescribed at 900 mg 3 times a day, to maximum effect, while attempting to minimize side effects.

With a goal of addressing the patient’s rehabilitation needs as comprehensively as possible, OMT was utilized where appropriate, and the persistent spasticity was monitored closely. The patient was referred for aquatic therapy for both an acute knee pain issue as well as her impaired ambulation. The patient also was referred to a clinical psychologist for depression and to help her adjust to her disability.

Discussion
As osteopathic physicians, we are uniquely positioned to help identify and treat patients with similar myelopathic conditions. Many patients seek us out for musculoskeletal and/or neurological concerns. We may be considered on the front-line of primary care and specialist evaluations of these patients.

Patients presenting with cervical myelopathy can be readily identified with a neurologic screening exam.6 This type of exam, which can be expanded or contracted based on specific patient presentation and findings, should be a prerequisite for evaluation prior to OMT. A neurologic screening exam is necessary for timely surgical planning. In addition, identifying significant neurological conditions can prevent potentially catastrophic outcomes from inappropriate application of any type of manual treatment (osteopathic, chiropractic, physical therapy mobilization, massage, etc.) that may be sought by the patient.

In this case, postoperative rehabilitation efforts were comprehensively optimized with a combination of OMT, medication management, physical therapy, and clinical psychology to best help the patient maximally recover her function and quality of life.

With the inherent focus on structure and function, OMT can be utilized to facilitate the postoperative rehabilitation of patients with myelopathy. Along with the conventional interdisciplinary team approach to neurological rehabilitation, OMT can assist patients to adapt, compensate, and continue to optimize their functional recovery. Somatic dysfunctions amenable to treatment include articular restrictions, myofascial strains (Jones’ points), and fascial distortions among others. OMT can be provided to reduce the patient’s structural and neurologic dysfunction.

Conclusion
The current case demonstrates the importance of a thorough evaluation for a patient presenting to an OMM clinic. By obtaining a thorough history and appropriately applying a standardized neurologic examination during the initial pre-OMT evaluation, red flag findings were identified. This 48-year-old female with 5 years of neck pain and weakness in the left arm was diagnosed with a cervical ependymoma from C7 to the foramen magnum. The timely diagnostic work-up expedited early referral for definitive surgical treatment.

In addition, the case presents an example of applying OMM techniques safely and effectively during the rehabilitation phase fol-

(continued on page 43)
lowing the patient’s cervical spine surgery. Osteopathic structural examination (OSE) can reveal somatic dysfunctions of primary neurologic etiology, or secondary compensatory dysfunction related to the altered function (eg, gait and mobility impairments and the effect on the musculoskeletal system).

To determine the full effect of OMT on patients recovering from spinal cord injuries, more studies are needed. It is this author’s experience that the combined use of OMT with other standard rehabilitation efforts provides a highly individualized treatment approach to best maximize functional recovery.

References


CONTINUING MEDICAL EDUCATION

This CME Certification of Home Study is intended to document your review of the CME article in this issue of *The AAO Journal* under the criteria for AOA Category 2-B continuing medical education credit.

**CME Certification of Home Study**

This is to certify that I, ____________________________,

(type or print name)

read the following article for AOA CME credit.

**Name of article:** “Osteopathic Evaluation and Post-Surgical Rehabilitation Approach in a Patient With Myelopathy and Tetraparesis Related to Cervical Ependymoma: A Case Report”

**Authors:** Drew D. Lewis, DO, FAAO


AOA Category 2-B credit may be granted for this article.

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(AOA number)

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Complete the quiz to the right by circling the correct answers. Send your completed answer sheet to the American Academy of Osteopathy. The AAO will forward your results to the American Osteopathic Association. You must answer 75% of the quiz questions correctly to receive CME credit.

1. Cervical myelopathy may be suspected in patients experiencing which of the following?
   a. Paresthesias, gait changes, or bowel or bladder function changes
   b. A visual loss in one eye
   c. Annular rash across the back

2. Ependymoma is best described as which of the following?
   a. A skin tag which is removed with electrocautery
   b. An intramedullary mass of the spinal column
   c. An inflammation of the superior portion of the testes

3. Management for neuropathic pain from an ependymoma can include which of the following? (select all that apply)
   a. Gabapentin
   b. Aquatic therapy
   c. Psychological assessment

4. OMT techniques during the subacute rehabilitation phase of a spinal cord tumor can include which of the following? (select all that apply)
   a. MFR
   b. Still technique
   c. HVLA
   d. Strain Counterstrain

Below are the answers to *The AAO Journal’s* March 2018 quiz on the article titled “Osteopathic Manipulative Treatment in the Management of Pediatric Headache and Orthodontic Intervention: A Case Report” by Katherine Heineman, DO.

1. **d.** All of the medications listed have been used for migraine and other headaches in children or adolescents.

2. **a.** Headache is one of the most common health complaints of children and adolescents.

3. **b.** In a primary headache disorder, the headache is thought to be intrinsic to the nervous system and not attributed to another disorder.

4. **c.** Lateral strain was found in the described case.
**Course Description**
Direct method high-velocity, low-amplitude (HVLA) techniques can be extremely effective, efficient, long-lasting and gentle manipulative procedures. The HVLA techniques presented in this course will address representative dysfunction in all areas of the body from foot to occiput; will embrace care delivered in a wide range of body positions (supine, prone, seated and lateral recumbent); and will address many common clinical conditions associated with pain and dysfunction. Techniques will be taught in the context of implementing postural-biomechanical or respiratory-circulatory clinical healthcare model goals in order to quickly impact common clinical conditions including headache, back pain, chest pain, and limb dysfunction. This method is designed to provide a logical context for later office use and for understanding indications and contraindications.

**Course Faculty**
Michael L. Kuchera, DO, FAAO, FNAOME, and Richard G. Schuster, DO

**Course Times**
Friday, Saturday and Sunday from 8 a.m. to 5:30 p.m.

**Continuing Medical Education**
24 credits of AOA Category 1-A CME anticipated.

**Meal Information**
Morning coffee and tea will be provided. Lunch will be provided each day. Notify AAO Event Planner Gennie Watts of any special dietary needs no fewer than seven days in advance.

**Course Location**
The Pyramids, Building Three
3500 DePauw Blvd., Lower Level, Conference Rooms A and B Indianapolis, IN 46268

**Travel Arrangements**
Contact Tina Callahan of Globally Yours Travel at (480) 816-3200 or globallyyourstravel@cox.net.

**Registration Fees**

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**Registration Form**
Mastering HVLA Manipulation
Aug. 10-12, 2018

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

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Register online at www.academyofosteopathy.org, or submit this registration form and your payment by email to GWatts@academyofosteopathy.org; by mail to the American Academy of Osteopathy, 3500 DePauw Blvd., Suite 1100, Indianapolis, IN 46268-1136; or by fax at (317) 879-0563.
Course Description
This course is an introductory course in visceral techniques to the thorax and thoracic viscera. Attendees will explore traditional osteopathic concepts of ventral technique as they apply to the thoracic viscera, ribs and anterior neck. Emphasis will be placed on physical examination, functional anatomy, and the anatomical relationships between diaphragm, ribs, sternum, thoracic spine and cervical spine, to the base of the skull, particularly as they relate to fascial continuity. Included will be discussion of the autonomic nervous system, vascular flow and lymphatic drainage.

Attendees will come away with improved confidence in physical examination, direct and indirect approaches to the ribs and thoracic viscera, and lymphatic techniques. Integration of visceral (ventral) techniques with spinal (dorsal) and cranial techniques will be emphasized at the conclusion.

This is an intermediate level course.

Prerequisites
It is strongly encouraged, though not required, that participants have taken a course in abdominal visceral approaches.

Course Times
Friday and Saturday from 8 a.m. to 5:30 p.m.
Sunday from 8 a.m. to 12:30 p.m.

Continuing Medical Education
20 credits of AOA Category 1-A CME anticipated.

Meal Information
Morning coffee and tea will be provided. Lunch will be provided Friday and Saturday. Notify AAO Event Planner Gennie Watts of any special dietary needs no fewer than seven days in advance.

Course Location
Rowan University School of Osteopathic Medicine
42 East Laurel Rd., Stratford, NJ 08084

Course Director
Richard G. Schuster, DO, is in private practice in Indianapolis, and he teaches courses in osteopathic manipulative treatment around the country.

After completing an undergraduate fellowship in osteopathic principles and practice, Dr. Schuster graduated from the Ohio University Heritage College of Osteopathic Medicine in 1994. He completed a residency in family medicine at the Firelands Regional Medical Center in Sandusky, Ohio, and he completed a postdoctoral fellowship in sports medicine at the Toledo Hospital in Ohio.

The chair of the AAO’s 2015 Convocation in Louisville, Kentucky, Dr. Schuster serves on the AAO’s Board of Trustees, and he is the vice chair of the AAO’s Education Committee.

Travel Arrangements
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Registration Form
A Fascial Approach to the Thoracic Viscera
Nov. 9-11, 2018

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☐ I am a resident or intern.
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View the AAO’s photo and video release statement.
Course Description
Sometimes referred to as Module 1, this introductory course is an excellent starting point on the journey of learning the fascial distortion model (FDM). FDM is an excellent modality to be used in the clinic, on the field, and in the emergency room for fast and effective results.

While there are some specific FDM techniques, emphasis will be placed on thinking and working in the model while using all manipulative modalities.

Attendees will be introduced to the theory of FDM while focusing on the shoulder, ankle and knee regions. Learn how FDM expands the toolbox you use to help more patients. This modality is valuable for any practitioner and no previous manipulation experience is required.

All medical providers are invited to attend, including DOs, MDs, PTs, OTs, PAs, NPs, DPMs, etc.

Course Times
Friday from 5 to 9 p.m.
Saturday and Sunday from 8 a.m. to 5 p.m.

Continuing Medical Education
20 credits of AOA Category 1-A CME anticipated.

Meal Information
Morning coffee and tea will be provided. Lunch will be provided Saturday and Sunday. Notify AAO Event Planner Gennie Watts of any special dietary needs no fewer than seven days in advance.

Course Location
The Pyramids, Building Three
3500 DePauw Blvd., Lower Level, Conference Rooms A and B
Indianapolis, IN 46268

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View the AAO’s photo and video release statement.
June 9-13, 2018
The Osteopathic Cranial Academy
Introduction to Osteopathy in the Cranial Field Summer Course
Course director: Richard F. Smith, DO
Hilton Norfolk at the Main
Norfolk, Virginia
40 credits of AOA Category 1-A CME anticipated
Learn more and register at www.cranialacademy.org.

June 14-17, 2018
The Osteopathic Cranial Academy
2018 Annual Conference: Discovering the Heart of Osteopathy
Program chair: Donald V. Hankinson, DO
Assistant program chair: Thomas A. Moorcroft, DO
Hilton Norfolk at the Main
Norfolk, Virginia
22.25 credits of AOA Category 1-A CME anticipated
Learn more and register at www.cranialacademy.org.

July 13-17, 2018
Michigan State University College of Osteopathic Medicine
Craniocervical Techniques: Part III
Course director: Barbara J. Briner, DO
East Lansing, Michigan
35 credits of AOA Category 1-A CME anticipated
Learn more and register at com.msu.edu/cme.

July 25-29, 2018
Osteopathy's Promise to Children
Foundations of Osteopathic Cranial Manipulative Medicine
(The 40-Hour Basic Course)
Course director: R. Mitchell Hiserote, DO
Osteopathic Center San Diego
40 credits of AOA Category 1-A CME anticipated
Learn more and register at the-promise.org/cme.

July 27-29, 2018
Indiana Academy of Osteopathy
Sequencing 1: The Art of Finding the Key
Course director: Charles A. Beck, DO, FAAO
Indianapolis
24 credits of AOA Category 1-A CME anticipated
Learn more and register at www.indianaacademyofosteopathy.com.

Aug. 2, 2018
Indiana Osteopathic Association
Preconference OMT Workshop: What HVLA Used To Be
French Lick Resort in Indiana
8 credits of AOA Category 1-A CME anticipated
Learn more and register at www.inosteo.org.

Aug. 3-4, 2018
Indiana Osteopathic Association
2nd Annual Summer Update and Weekend Getaway
French Lick Resort in Indiana
15 credits of AOA Category 1-A CME anticipated
Learn more and register at www.inosteo.org.

Aug. 3-4, 2018
Osteopathy’s Promise to Children
Advancing the Sequential Approach to Pediatric Osteopathy
Course directors: Mary Anne Morelli Haskell, DO, FACOP,
and Julie Mai, DO
Osteopathic Center San Diego
16 credits of AOA Category 1-A CME anticipated
Learn more and register at the-promise.org/cme.

Sept. 8, 2018
Osteopathy’s Promise to Children
OMT for Systemic Disorders and Physiological Functions:
Cardiopulmonary and Immune Systems
Course director: Hollis H. King, DO, PhD, FAAO
Osteopathic Center San Diego
8 credits of AOA Category 1-A CME anticipated
Learn more and register at the-promise.org/cme.

Sept. 14-15, 2018
Osteopathy’s Promise to Children
Integrated Osteopathic Dental Team—
Part 1: Practical Resolution of Complex Sleep Disturbances
Course director: Julie Mai, DO, and Darick Nordstrom, DDS
Osteopathic Center San Diego
16 credits of AOA Category 1-A CME anticipated
Learn more and register at the-promise.org/cme.

Sept. 14-16, 2018
Michigan State University College of Osteopathic Medicine
Integrated Neuromuscular and Myofascial Release
Course director: Lisa Ann DeStefano, DO
East Lansing, Michigan
19 credits of AOA Category 1-A CME anticipated
Learn more and register at com.msu.edu/cme.

Visit www.academyofosteopathy.org/affiliate-cme for additional listings.