

Research in the Osteopathic Medical Profession: Roadmap to Recovery

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Since the founding of osteopathic medicine in the late 19th century, the profession has gained national acceptance. Today, osteopathic physicians (ie, DOs) are licensed to practice medicine and surgery in all 50 states with the same rights and privileges as physicians who hold MD degrees (ie, MDs). Despite these gains, osteopathic medicine lags far behind not only the MD medical profession but also most other health professions with high research activity and scholarship. In this article we present a sobering self-assessment that illustrates the disparity between osteopathic medicine's contributions to health and medical research compared with our professional colleagues. We offer specific recommendations that constitute a roadmap to recovery, calling for a coordinated strategy involving change both within and among our institutions and change in how our governing accreditation standards are embraced and implemented. By developing a comprehensive research agenda through strategic realignments and investments, the osteopathic medical profession can begin to play a more influential role in shaping the future of medicine.

Osteopathic Medicine and Scientific Inquiry Should Be Inextricably Linked

The earliest writings of Andrew Taylor Still, MD, DO, asserted that osteopathic medicine must be defined and directed by scientific inquiry. Unequivocally, Still's vision of osteopathic medicine was rooted in scientific inquiry; the basis of osteopathic medicine is "of such exact, exhaustive, and verifiable knowledge of the structure and function of the human mechanism."¹ Similar to the inseparable nature of structure and function, Still believed that science and medicine united in forming the underlying principles of osteopathy.

Have we lost sight of our original grounding in science and the link between scientific evidence and osteopathic principles and practice (OPP)? Osteo-

pathic physicians have the same rights and privileges as allopathic physicians, yet the osteopathic medical profession compares unfavorably to other health care professions with respect to certain measures of research and scholarly achievement. Over the years, the osteopathic medical profession—osteopathic medical schools, in particular—have acknowledged the need for organizational changes necessary to enhance research productivity,²⁻⁵ but these calls have gone largely unheeded. The American Osteopathic Association (AOA) Council on Research recently released its *2013-22 Research Strategic Plan for the Osteopathic Medical Profession*.⁶ Degenhardt and Standley⁷ made a strong case for greater emphasis on and investment in research by both osteopathic medical schools and the governing bodies of the osteopathic medical profession. A potential shortcoming of this plan, however, is that the primary focus is on "osteopathic research," in which osteopathic manipulative medicine (OMM) and OPP appear to be the main foci for investigation and investment. It is clearly the prerogative of a foundation or funding organization to choose how to spend their members' money, but one must question whether this approach marginalizes our profession by ceding new developments in the vast panoply of modern health care not only to MDs but also to all other research-driven health care professionals. The decision to primarily focus research resources on OMM and OPP, in our opinion, places the osteopathic medical profession on par with the foci from the DC (doctor of chiropractic)-granting institutions much more so than the MD-granting institutions. From a sustainability perspective, providing "seed funding" for research where the extramural funding opportunities from other agencies is so limited raises the following question: Is it feasible and pragmatic to build a large cadre of self-sufficient scientists conducting OMM and OPP research? Although the National Center for Complementary and Alternative Medicine of the National Institutes of Health (NIH) is clearly interested in, and funds research on,

manual therapies, its pocket book is terribly limited relative to other aspects of medical research (their 2013 budget was <0.5% of the NIH's entire budget).⁸ Accordingly, we argue that the AOA Council on Research should look to fund the best scientific research, without the limits imposed by OMM, that will significantly increase both the amount and quality of scientific contributions from osteopathic medical schools. Developing a stronger overall scientific reputation by contributing to major health care advances is the most critical factor in promoting osteopathic medicine. In this article, we acknowledge the current unacceptably low level of research activity in the osteopathic medical profession but offer a challenging roadmap to recovery that will lead to active engagement in a broad range of medical research, particularly related to primary care.

As medicine and science move into the 21st century, there should be serious concern raised by the osteopathic medical profession about the osteopathic medical profession with regard to research. Osteopathic medicine has seen tremendous growth and acceptance in the past 3 decades. In the 2013-2014 academic year, there were 29 osteopathic medical schools offering instruction at 37 locations in the United States.⁹ In addition, more than 20% of medical students are enrolled in osteopathic medical schools.¹⁰ As such, for the overall health of our nation, it is critical that osteopathic medical schools not only provide outstanding medical education to our future physicians, but also contribute substantially to the scientific biomedical and clinical advances required to improve health care. Although our schools have been more successful in delivering quality medical education, our efforts in advancing biomedical and health research are sorely lacking. Has osteopathic medicine simply become complacent since achieving practice equivalence with MD physicians? Has the profession lost its dedication to scientific inquiry that defined our origins, while other health professions led the way in advancing the broader field of medicine and health care?

Several examples exist that demonstrate the disparity between osteopathic medicine's research productivity compared with that of our professional colleagues. This "gap" in research focus and productivity can be viewed more accurately as a research quality "chasm." Our goal is not to malign but to sound an alarm, challenging the osteopathic medical profession to engage in research with the same passion and commitment that we devote to teaching and service. To succeed, we believe the profession and its leaders must commit to (1) greater investment in faculty, with explicit expectations and accountability for research productivity; (2) more training and seed money to support a change in research culture; (3) extensive student mentoring and instruction in research methodology; and (4) rigorous implementation of our research accreditation standards. All of these steps are needed if we hope to contribute meaningfully to medical research as it rapidly evolves the health care system in the United States.¹¹

The Evidence: A Candid Self-Assessment

Example 1: Schools of Osteopathic Medicine Rank Last in NIH Funding and Have Low Scholarly Activity

A 2012 article in *The Journal of the American Osteopathic Association* examined research funding at colleges of osteopathic medicine in the United States and concluded that "research activity at colleges of osteopathic medicine continues to advance partly because of investments in research and faculty made by colleges of osteopathic medicine."¹² While this finding may be seen as positive news within the narrow context of osteopathic medicine alone, when viewed within the larger context of overall health-related research, the picture is dramatically different. For instance, in fiscal year 2011, "Schools of Osteopathy" (as we are classified by the NIH) ranked last among the 17 different types of educational institutions receiving NIH funding, according to NIH's

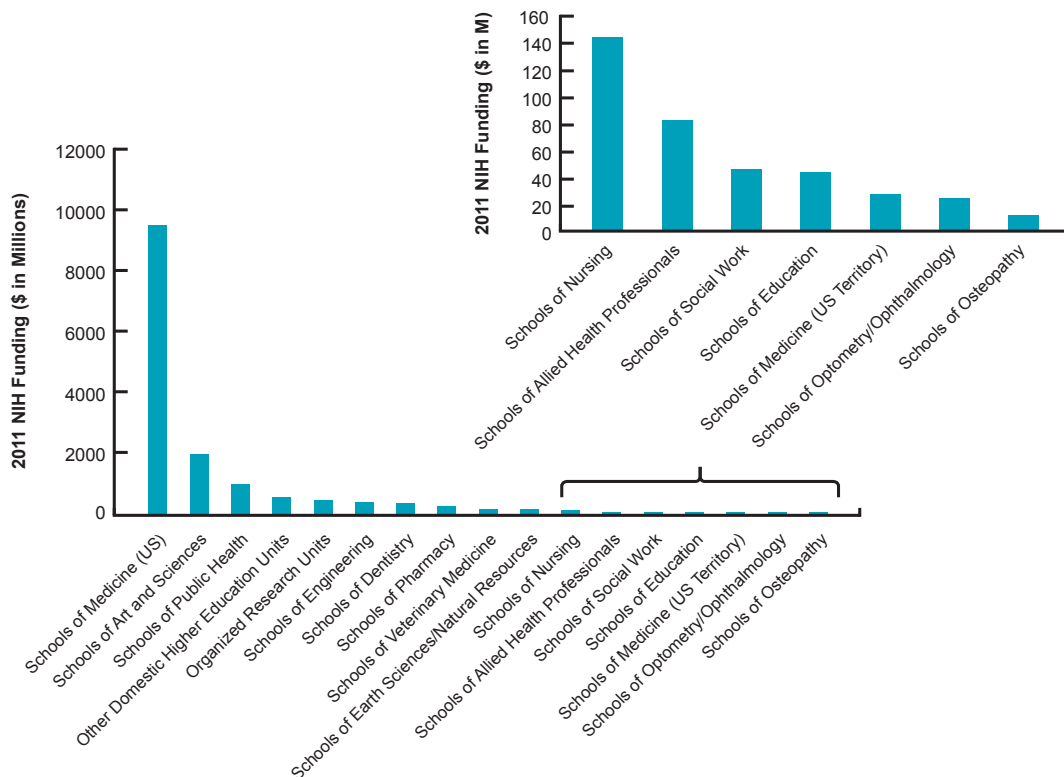


Figure 1. National Institutes of Health (NIH) research funding in 2011 sorted by educational institution type using data extracted from NIH’s RePORT (Research Portfolio Online Reporting Tools).⁸ The 7 lowest-funded institution types are shown in the inset to increase discrimination clarity, with “Schools of Osteopathy” last. The NIH categorizes osteopathic medical schools as “schools of osteopathy.”

RePORT (Research Portfolio Online Reporting Tools) (*Figure 1*).⁸ Compared with their funding of schools of medicine, NIH funding of schools of osteopathy is insignificant; schools of medicine received 800 times greater funding. Just as distressing is the fact that funding for schools of osteopathy lags behind virtually every other health-related profession, including schools of arts and sciences (170× greater funding), public health (88× greater funding), engineering (37× greater funding), dentistry (30× greater funding), pharmacy (24× greater funding), veterinary medicine (16× greater funding), nursing (12× greater funding), social

work (4× greater funding), education (3× greater funding), and optometry (2× greater funding).

Scholarly activity (as measured by peer-reviewed publications) originating from osteopathic medical schools is therefore also wanting. In the 5-year period from 2006 to 2010, 28 colleges of osteopathic medicine combined to produce only 1843 publications.¹⁰ This translates to fewer than 15 publications per year per school, and more than a quarter of these publications had never been cited.¹³ Clearly, scholarly contributions from osteopathic medical schools are unacceptably low in both quantity and quality.

Example 2: Many Osteopathic Medical Students Believe Insufficient Research Opportunities and Training Are Available

According to a 2011 survey,¹⁴ osteopathic medical students reported that they devoted only 2% of their time during their clerkship years to research endeavors, and more than half of graduating osteopathic physicians chose residency training in either

an MD (40%) or a dual DO/MD (12%) residency program over a DO residency program (29%) because they “believe better training and educational opportunities [are] available” in the former programs.¹⁴ Further, nearly half of graduating osteopathic medical students feel that an inadequate amount of time is devoted to learning research techniques, cost-effective medical practices, literature analysis skills, and biostatistics during their training.¹⁴ Taken together, these data demonstrate that a substantial proportion of osteopathic medical students are not satisfied with the research culture encountered during medical school.

Example 3: The Osteopathic Medical Profession Continues to Embrace and Practice Concepts and Treatments That Lack Evidence-Based Support

Has the osteopathic medical profession turned a blind eye to evidence-based medicine (EBM; defined here as the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients)? How do we balance the need to create a unique identity against the importance of accepting and assimilating scientific and clinical evidence that must ultimately determine best treatments and advances in health care? Regrettably, there are clear examples demonstrating that the profession sometimes espouses unsubstantiated medical practices (eg, certain applications of osteopathic manipulation), and there are other practices codified in osteopathic medicine that do not yet have an adequate evidence base and require additional study. For the profession to gain greater credibility within the broader health care community, its medical schools and affiliated residency programs must adopt an evidence-based approach in their clinical training that supports and produces high-quality medical research, even if this approach results in relegating century-old but unverified concepts to the history books. We believe these changes are critical to the long-term survival of the osteopathic medical profession.

Roadmap to Recovery

As osteopathic medical schools continue to proliferate across the nation, and as the ranks of DO graduates swell, the future of medicine will increasingly depend on osteopathic medical schools to provide both outstanding medical education and active engagement in scientific and medical advances. To achieve the goal that osteopathic medicine must embrace research, scientific inquiry, and the application of EBM, we propose a 3-pronged strategy that articulates specific steps in an effort to address the lack of progress despite previous calls for change.^{2-5,7} The collective impact of a coordinated strategy requires the cooperation of all osteopathic medical schools as well as changes in how the accreditation standards that govern osteopathic medical schools are implemented. By adopting this strategy, we believe that it is possible to increase extramural research, programmatic funding, and the impact of the osteopathic medical profession’s scholarship; enhance the predoctoral research educational experience; and ensure that the osteopathic medical profession is an active participant in creating the evidence base that defines medicine.

First, we must look within osteopathic medical schools and offer recommendations to strengthen the research agenda. Specifically, we encourage all osteopathic medical schools to (1) increase medical education curricular content relating to research methodology and the application of EBM, (2) hire more research-active faculty, (3) raise faculty research expectations, (4) invest in faculty mentoring in research, (5) embed routine data collection into affiliated health care delivery systems to support clinical research and data-driven decision making, and (6) secure the necessary commitment from administrative leadership to align incentives and infrastructure that drive the necessary culture shift. Although we believe that most practicing DOs support the notion that medical practice should be linked to scientific inquiry and

that clinical practice should reflect the dictates of EBM, few may recognize the need for reform or the challenges involved in generating the necessary changes.

Nurturing a research culture within the osteopathic medical profession is a complex and difficult task. The deans and presidents of our colleges must recognize that an investment in research strengthens the profession's commitment and ability to produce the best primary care physicians. By changing how research is embedded in the fabric of our institutions, we will advance our profession's reputation and research identity.

Second, we call for the creation of regional and national research networks that bring together osteopathic medical schools and their surrounding universities and communities for cooperative inter-

*Unless someone like you cares
a whole awful lot, nothing is
going to get better. It's not.
—Dr Seuss, The Lorax, 1971*

institutional research. It is not realistic to expect rapid expansion in the ranks of our research faculty; however, it is feasible to focus on the development of research networks, reducing the isolation of existing researchers and expanding the opportunities for faculty to become connected to research teams. In the current funding environment, the competition for federal grants is fierce, and the ability to generate a return on investment in the short term is unlikely. If existing and future osteopathic medical schools could develop close ties with, or even be housed within, major research universities, these partnerships would create a structure for advancing scholarly activity with potentially lower initial financial investment. Of the more than 200 "research universities" and 90 "doctoral/research universities" classified as "high" and "very high" in research activity by the Carnegie

Classification of Institutions of Higher Education, about half are not currently affiliated with a college of medicine. By establishing partnerships through research networks, collaborative strategies can be designed for faculty development, research mentoring, shared equipment, research participant recruitment, access to new patient populations, and joint proposal development. Efforts to work collectively are not dependent on knitting together institutions with similar research profiles, but rather blending together institutions whose strengths complement one another.

The third prong of this strategic plan calls for strict adherence to the existing Commission on Osteopathic College Accreditation research requirement as it relates to research expectations and productivity for osteopathic medical schools. Accreditation Standard Seven¹⁵ requires only that faculty have adequate time dedicated to research, it is the responsibility of our institutions to explicitly define the quantity and quality that constitutes an "adequate" research effort. And why stop at adequate? More importantly, what happens when institutions shirk this responsibility? The opportunities for research in the osteopathic medical profession are abundant. We need not be limited to research on OMM and other constructs historically tied to the profession; rather, we should expand our horizons to include the broader fields of musculoskeletal health, chronic disease, and other research with a primary care focus.

Our roadmap to recovery addresses many of the contributing factors that account for low research productivity in osteopathic medical schools, including the small numbers and inadequate research training of faculty, insufficient research investment and infrastructure, and lack of research expectations for both faculty and students (Figure 2). The lack of generalized critical thinking and formal training in research during medical school leads to a low appreciation of and devotion to research. The osteopathic medical pro-

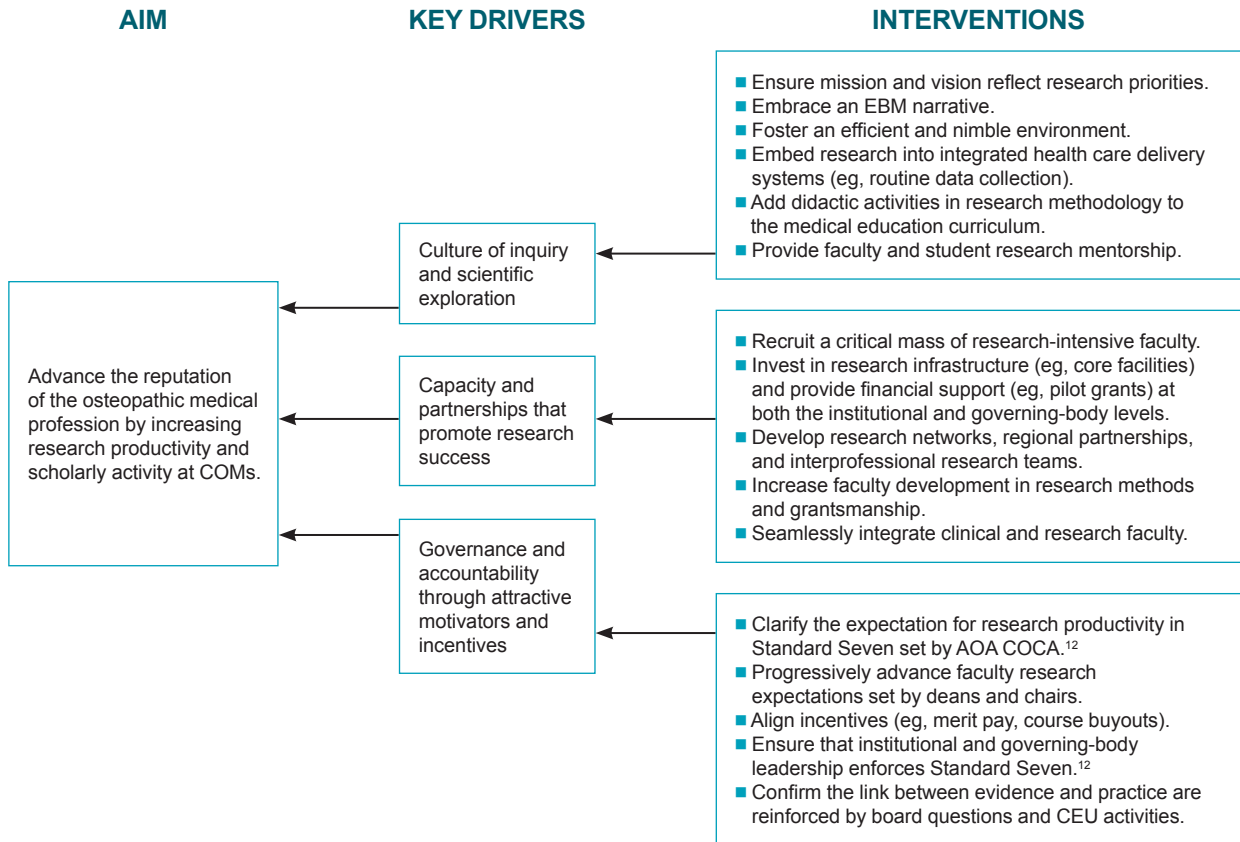


Figure 2. Strategic roadmap to recovery. Key drivers and interventions necessary for the advancement of the reputation of the osteopathic medical profession by means of increased research productivity and scholarly activity at colleges of osteopathic medicine. *Abbreviations:* AOA COCA, American Osteopathic Association Commission on Osteopathic College Accreditation; CEU, continuing education unit; COM, college of osteopathic medicine; EBM, evidence-based medicine.

profession’s endorsement of for-profit medical schools may exacerbate these issues if research is not prioritized, because research activity may be expected to negatively affect profitability. Regrettably, many existing osteopathic medical schools (whether for-profit or not) lack a traditional academic medical campus environment in which the school is integrated with clinical facilities and an engaged staff committed to education, patient care, and research—all critical elements that contribute to a vibrant research culture.

Conclusion

We believe the future of the osteopathic medical profession will depend largely on public and professional perceptions of its graduates and institutions. When first introduced to a doctor of osteopathic medicine, will a patient perceive her or him as a member of a profession vigorously engaged in scientific inquiry and the application of EBM? We run the risk of recapitulating history if we do not address the barriers to research. To ensure a long and prosperous future for osteopathic medicine, we encourage a

grassroots effort by practicing osteopathic physicians to strongly support the research endeavors of their profession and their medical schools, which are well positioned to join the reform of primary care and the health care delivery system in the United States. In addition, we suggest the development of joint evidence-based outcome research programs whereby DO-granting and MD-granting institutions partner to conduct rigorous scientific investigations on the clinical effectiveness of selected OPP. Swift action is needed for the osteopathic medical profession to enhance its credibility and relevance, which, if not addressed, could threaten its very survival in this critical time of health care transformation. (doi:10.7556/jaoa.2014.124)

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Authors' Note: During the peer review process of this article, we were asked to define the most critical change necessary to increase research productivity in the osteopathic medical profession. In our opinion, research and scholarly activities at DO-granting medical schools (and postgraduate training programs) must (1) advance human health and (2) be a fundamental requirement for COCA accreditation. We believe the profession is significantly weakened by DO-granting institutions that do not engage actively in medical research. The generation of new knowledge to advance human well-being is an inherent responsibility of all medical schools. Further, establishing new schools that lack both infrastructure and support for medical research is a grave mistake. For DOs to remain on the same playing field as their MD colleagues, immediate reform is needed. Without osteopathic medical schools actively engaged in meaningful medical research and scholarly activity, the osteopathic medical profession risks being held in the same regard as other professions that lack a substantial commitment to advancing medical knowledge.

Editor's Note: Drs Clark and Blazyk have a long history of serving the osteopathic medical profession. Although they are not osteopathic physicians, they have more than 4 collective decades of experience in teaching and conducting research at osteopathic medical schools and interacting with the broader osteopathic medical profession.