FEATURE ARTICLE

The Status of Acupuncture and Oriental Medicine in the United States

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ABSTRACT Since its first mention in U.S. media in the early 1970s, the practice of acupuncture and Oriental medicine (AOM) has grown in stature from a fringe, counter-culture movement to a valid, evidenced-based treatment option for patients. In the last 40 years, AOM schools and colleges have been accredited by the U.S. Department of Education, offering both masters and doctoral degree programs. To date, forty-seven states and the District of Columbia license or certify acupuncturists based on competency proven through state examination or professional certification by the National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM). As acceptance of AOM in the U.S. has increased through both the assurance of psychometrically sound certification and the education of the American public on this topic, many challenges have emerged. Problems such as the underemployment of AOM clinicians, methodological hurdles for the investigation of mechanisms, and efficacy of acupuncture and other AOM treatment techniques have been observed. Investigative challenges also include gaps in research training as well as a dearth of the basic resources needed to conduct randomized controlled trials (RCTs). As AOM research has sought integration into the Western research model, problems have been identified in the design of AOMRCTs, and strategies for their resolution through methods such as translational research have been examined. Incorporating these strategies as well as efficacy, effectiveness, and qualitative measures will strengthen the evidence base and thus provide clinical decision makers with more tools that can be used to design patient treatment regimens.

KEYWORDS acupuncture, Oriental medicine, status, research, United States, challenges

Origins and Development

Oriental medicine was first discussed by U.S. media sources when *New York Times* reporter James Reston returned from a trip to China where he covered President Nixon's visit to Beijing. Reston wrote about receiving acupuncture for post-appendectomy pain which occurred during the trip. The front-page article, "Now, About My Operation in Peking," appeared in the *New York Times* on July 26, 1971.[1] As a result of this media saturation, a new American fascination emerged regarding Oriental medicine, resulting in a marked increase in the number of Americans seeking acupuncture and Chinese medical herbal treatments in the U.S.

Acupuncture training programs for American students began in the mid-1970s. The first acupuncture school, the New England School of Acupuncture (NESA), was established in 1975 in Newton, Massachusetts.[2] These early programs varied in length of training and content. Most of the instructors were Chinese Americans who had received traditional Chinese medicine (TCM) training in China.

Some of these early programs granted certificates to students who completed the programs, declaring them as Oriental medical doctors (OMD) or doctors of Oriental medicine (DOM). The OMD and DOM designations were not, however, official educational degrees granted by the U.S. Department of Education (USDE). In 1982, as part of an effort to improve the standards and consistencies of U.S. TCM training programs, the Council of Colleges of Acupuncture and Oriental Medicine (CCAOM) was founded by acupuncture and Oriental medicine

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(AOM) professionals to work together to promote the integrity of the profession. The first major national association for practitioners of AOM was the American Association of Oriental Medicine founded in 1981. Together these organizations co-founded the Accreditation Commission for Acupuncture and Oriental Medicine (ACAOM) in 1982. ACAOM was recognized by the USDE in 1988 to accredit master's degree programs.[3] In 1988, NESA became the first ACAOM-accredited training program for acupuncture and Oriental medicine, graduating its first Master's in Acupuncture class in 1996.[4]

Established in 1982, the National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM) is the only national organization that validates entry-level competency in the practice of acupuncture and Oriental medicine through professional certification pathways. NCCAOM certification, including a passing score on the NCCAOM certification examinations, documents minimal level competency for licensure as an acupuncturist and is recognized as the entry-level standard by 43 states and the District of Columbia.[5]

In response to Americans' interest in alternative treatments, the National Institutes of Health (NIH) created the Office of Unconventional Therapies (OUT) in the early 1990s. The office was given a budget of two million dollars per year. OUT issued their first request for applications (RFA) in 1993 and received more responses to that RFA than any other office received in the history of the NIH. The NIH changed the title of OUT to the Office of Alternative Medicine (OAM) and later it was named the National Center for Complementary Alternative Medicine (NCCAM). The current budget of NCCAM is over $100 million per year.

One of the early pioneers of complementary and alternative medicine (CAM) in the U.S., Brian Berman, MD, founded OUT, OAM, and NCCAM at the NIH. In 1991 Dr. Berman also began the Center for Integrative Medicine at the University of Maryland Medical School in Baltimore. In a 2011 interview published in *The American Acupuncturist*, he explains that the Baltimore center assisted in creating the Cochrane Collaboration, an international organization headquartered in Oxford, England. Its mission is to bring together the best evidence in health care, to keep it current, and to do systematic reviews of the literature. A result of these efforts is their work with the National Library of Medicine in assembling key words and headings to assist researchers searching for related articles in the scientific literature. Currently, the Cochrane Collaboration database has approximately 40,000 CAM randomized controlled trials, with over 5,000 systematic reviews in the Cochrane Database of Systematic Reviews. The Cochrane Collaboration includes over 20,000 members in more than 100 countries.[6,7]

Because acupuncture gained momentum as a valid complementary medicine discipline in the U.S., in 1997 it was examined and evaluated at an NIH Consensus Conference. A team of experts was assembled to report on several highly visible prospective trials on acupuncture, which found positive effects from acupuncture treatments. A statement from that conference, published in the *Journal of the American Medical Association*, reported, "...promising results have emerged... showing [the] efficacy of acupuncture in adult post-operative and chemotherapy [induced] nausea and vomiting and post-operative dental pain. There are other situations such as addiction, stroke rehabilitation, headache, menstrual cramps, tennis elbow, fibromyalgia, myofascial pain, osteoarthritis, low back pain, carpal tunnel syndrome and asthma where acupuncture may be useful as an adjunct treatment or an acceptable alternative or be included in a comprehensive management program."[8] The NIH Consensus report helped acupuncture make significant strides in the Western allopathic medical community as a palliative therapy for a variety of symptoms and conditions.

According to a 2007 National Health Interview Survey, which included questions on the use of various CAM therapies, an estimated 3.1 million U.S. adults had received acupuncture in the previous year. In addition, this same survey stated that approximately 17% of adults used natural products, including Chinese herbs.[9]

Theoretical AOM Systems Practiced in the U.S.

During the first 25 years that Chinese medical education was offered in the U.S., almost all AOM schools taught specific TCM diagnostic and treatment strategies. "TCM," as it is known, is a system of Chinese medicine comprised of a distillation of many forms and styles of practice rooted in classical

theory. During the 1950s in China, efforts were made to develop systematization and standardization of classical Chinese medical concepts to better provide inexpensive health care to its growing population. This construction of Chinese medicine removed much of the philosophic underpinnings of the historic material and better organized divergent lines of thought. Based on traditional pulse and tongue diagnosis as well as a series of standardized questions and approaches to physical exam, acupuncture techniques, herbal prescriptions, and recommended diet and lifestyle modifications were designed to treat both the root of a disease and the symptoms resulting from its underlying condition.

In addition to TCM-based training programs, several U.S. schools teach five-element theory, a system that originated in England and developed by the scholar J.R. Worsley. This technique follows the classical concept of balancing the five elements.[10] Other schools that teach Chinese medicine today are moving towards a focus on classical Chinese medicine directly referenced in ancient texts, such as the *Huangdi's Internal Classic* (Huang Di Nei Jing), *Classic of Difficulties* (Nan Jing), and *Treatise on Cold Damage and Miscellaneous Diseases* (Shang Han Za Bing Lun). Some schools have also incorporated newer treatment strategies developed by masters such as Richard Tan, Master Tung, and Master Zhu, who teaches about scalp acupuncture. Other techniques that are taught include auricular acupuncture, Korean 4 needle technique, Korean hand acupuncture, and Japanese meridian style theory and treatment.

Joseph M. Helms, author of Acupuncture Energetics: A Clinical Approach for Physicians,[11] founded the Helms Medical Institute (HMI), which teaches treatment strategies coined as "medical acupuncture." The first course, Medical Acupuncture Treatment for Physicians, was sponsored by the American Holistic Medical Association in 1980. This teaching mode continues to be short-course training over a period of 200–300 h and includes much independent study by the physician students. HMI offered the course in collaboration with the continuing medical education offices of UCLA and Stanford Schools of Medicine. It is accredited by the Accreditation Council for Continuing Medical Education and until 2008 was the sole sponsor of the course. In addition to this basic training program, HMI developed the curriculum for intermediate and advanced clinical programs. To date, HMI has trained more than 6,000 physicians in Helms' style of acupuncture application.[12]

In early acupuncture research, many MD researchers used the Helms' energetics system to design their acupuncture research protocols. It should be noted that this style is distinctly different from in the style from which acupuncture classically developed, and the training is notably shorter and more protocol-based than other styles of acupuncture. Because of the lack of historical precedent for this style, the clinical basis for predicting treatment outcomes is weaker than that of more classical approaches. Currently, most clinicians in the U.S. who practice acupuncture full-time use a style based in TCM with an eclectic mix of some of the newer theoretical systems and an increasing use of classical Chinese medical concepts and approaches.

Introduction to Acupuncture in Western Medical Curricula

Following the 1997 NIH consensus statement, the NIH granted 15 major medical universities monies to integrate CAM training into their medical curricula. It should be noted that "CAM" is a broad, non-specific term and open to wide interpretation. Indiana University School of Medicine (IUSM), the largest medical school in the U.S., was one of these institutions. IUSM used their five-year RO1 grant to develop an elective program for fourth year medical students and third year internal medicine residents. During each year of this five-year grant, seven students were selected two times each year to take part in the month-long elective. The program was developed to inform doctors in training about the basic concepts of a number of CAM therapies that their future patients might be receiving. The internship required them to spend time shadowing CAM clinicians in selected CAM clinics in Indiana.

In a survey conducted by researchers at Harvard in 1998, replies from 117 of the 125 U.S. medical schools reported that 75 schools offered courses in CAM therapies (64%). Of the 123 courses reported, 85 were stand-alone electives and 38 were part of a required course. Topics presented included basics of chiropractic, acupuncture, homeopathy, herbal therapies, and mind-body techniques.[13] It should be noted that these were mostly survey courses rather

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than courses designed to train medical students to actually utilize CAM therapies.

In a 2002 study conducted by researchers at IUSM, questionnaires were sent to 73 course directors at 53 medical schools that included CAM in their curriculum. The results revealed that the topics most often being introduced were acupuncture (76.7%), herbs and botanicals (69.9%), meditation and relaxation (65.8%), spirituality/faith/prayer (64.4%), chiropractic (60.3%), homeopathy (57.5%), and nutrition and diets (50.7%). At that time, only a few of the courses (17.8%) emphasized a scientific approach to the evaluation of CAM effectiveness.[14]

Additionally, studies to assess attitudes among preclinical medical students toward CAM and its place in the medical school curriculum and medical practice have been conducted. At Georgetown University School of Medicine in Washington, D.C., 266 first-year and second-year medical students rated their attitudes toward CAM modalities. Nearly all (91%) students agreed that "CAM includes ideas and methods from which Western medicine could benefit." More than 85% agreed that "knowledge about CAM is important to me as a student/future practicing health professional," and 75% felt that "CAM should be included in the curriculum."[15]

Collaboration in Research

During the past 10 years there has been a huge emphasis on scientific examination of the mechanisms of action for the effectiveness of CAM therapies, specifically acupuncture and Chinese herbal medicines.[16] The two groups most responsible for the contribution of evidence to the scientific literature on these topics are the Society of Acupuncture Research (SAR) founded in 1993[17] and the Society for Integrative Oncology (SIO) founded in 2003.[18] Both SAR and SIO are U.S.-based international societies that hold the majority of their conferences in the U.S. Their memberships both include TCM trained AOM researchers, MDs and PhDs. In both societies, much of the research presented at their annual meetings is conducted through collaboration of TCM trained researchers and Western trained medical doctors and carried out at major medical schools and comprehensive research institutions.

Currently, the top five U.S. cancer centers as ranked by U.S. News and World Report include licensed acupuncturists on staff, and they fund and conduct AOM research. Each of these centers is a National Cancer Institute (NCI)-designated comprehensive cancer center. These include the MD Anderson Cancer Center, the Memorial Sloan Kettering Cancer Center, the Mayo Clinic, Johns Hopkins Hospital, and the Dana-Farber/Brigham and Women's Cancer Center.

Current Status and Problems Faced by TCM Practitioners in the U.S.

Unemployment, or under-employment, is a problem many TCM practitioners face in the U.S. Though AOM is rapidly gaining acceptance as a valid, complete medicine system and millions of Americans are seeking alternative therapies, there are few formal job opportunities for AOM professionals within the current Western medical model. Most U.S. hospitals do not employ acupuncturists, or if they do, they are hired as part-time subcontractors. This denies the TCM practitioner the benefits of healthcare coverage and paid vacation that full-time hospital employees enjoy. As late as 2012, the U.S. Bureau of Labor Statistics Handbook did not contain a listing for a TCM practitioner or acupuncturist as a recognized profession.[19] This may be changing in the near future because the AOM community has been working for nearly 10 years to establish a distinct category listing in this publication.

The primary source of income for the AOM professional is through private clinical practice. Very few of these AOM practices accept and/or bill insurance for their services. This is largely due to the lack of insurance plans that cover acupuncture services as well as the additional cost of hiring a billing professional. A recent review of seven reports that provides limited information about hours worked, income, and practice type over the past decade shows 50% of the licensed acupuncture workforce is working less than 30 h weekly; 50% are earning less than $50,000 on average; and the number of LAc's working independently in practice, either in their own office or sharing one, is approximately 90%.[20]

In the NCCAOM's most recent 2013 Job Analysis report, only 2.3% of 1,492 respondents reported working in a hospital setting. The remaining 97.7% worked either in private practice, an AOM group

practice, or some other type of integrative medicine group.[21] The data collected from job analysis surveys such as these are likely based on respondents who currently practice AOM in some fashion. A question remains unanswered is, "How many U.S. AOM school graduates are either unemployed or employed in a vocation unrelated to AOM?"

In the past 15 years, much of the federally-funded AOM research in the U.S. has been conducted by MDs that have limited acupuncture training. Equally problematic, acupuncturists trained by ACAOM accredited schools have limited training in research. Very few TCM researchers have access to online medical libraries such as MEDLINE or have access to the seed funding necessary to conduct pilot studies. Non-academic TCM researchers must collaborate with MDs and PhDs at universities and major research institutions to access online medical libraries and find resources for assembling a research team.

Current Challenges and Perspectives in AOM Research

In 2011, the U.S. Department of Education granted ACAOM's request for an expansion of educational programs to include post-graduate doctoral programs in acupuncture and Oriental medicine (DAOM). The DAOM program, currently offered at seven AOM schools in the U.S. is a combined clinical and research training program. Early attempts to integrate research techniques and methods into the AOM curriculum revealed a lack of positive perspective on the value of research. In 2009, surveys were conducted on AOM students at two institutions that integrated research training into their curriculum—the New England School of Acupuncture in Newton, Massachusetts and the Oregon College of Oriental Medicine in Portland, Oregon. Surveys at both institutions suggested a high interest in research in first-year AOM students; however, students at higher levels showed lower interest in this. Results also indicated that AOM students believed that research was highly relevant to how both the public and the health insurance industry view their system of health care but not highly relevant to their own clinical practice of AOM. In addition, they felt that the scientific methods used in research were not consistent with the principles of AOM.[22]

Currently, the most problematic issue discussed within the acupuncture research community, both in the U.S. and other Western countries, is the issue of usage of an adequate control. Concepts previously explored include "sham acupuncture," needleless placebo, or usual care. In the past five years, many studies reporting data on sham *vs*. true acupuncture are resulting in positive findings in the sham group. Highlighting this issue is the 2007 GERAC German acupuncture back pain study, which reports data on sham *vs*. verum acupuncture in 1,162 patients. The response rate was 47.6% in the verum acupuncture group, 44.2% in the sham acupuncture group, and 27.4% in the conventional therapy group.[23]

In the acupuncture research community, it is commonly said that "sham is not sham" because acupuncture needling at any point produces biochemical reactions in the body partially due to the cascade of biochemical events initiated from the local inflammatory response to the needle. Further, the idea that points on the body are disconnected simply because they are on different locations, or because they are not directly on an acupuncture "point" per se, is not in keeping with very elementary principles of Chinese physiology. Studies on the mechanisms behind the positive effects of local acupuncture needling report increase of fibroblast cells,[24] release of adenosine,[25] modulation on inflammatory cytokines,[26] and other local and systemic biochemical responses that can clearly be produced by sham needling.

Recently, some acupuncture researchers have been opting for the use of a validated, retractable acupuncture needle as a placebo, which is also controversial and has been studied extensively by Ted Kaptchuk's team at Harvard University. In a 2006 study on 270 adults with repetitive use arm pain, the retractable needle had greater effects than a placebo pill on self-reported pain over the entire course of treatment [–0.33 (–0.40 to -0.26) *vs*. 0.15 (–0.21 to –0.09), P=0.0001].[27] In that study, two hundred sixty-two adults with irritable bowel syndrome were randomized into three groups: waiting list (observation), placebo acupuncture alone ("limited"), or placebo acupuncture with a patient-practitioner relationship augmented by warmth, attention, and confidence ("augmented"). Results showed that 28% of patients reported improvement on the waiting list, 44% on the limited group, and 62% in the augmented group. The different placebo effects produced

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statistically and clinically significant outcomes and the patient-practitioner relationship was the most significant component.[28]

Addressing the issue of verum acupuncture not significantly outperforming sham acupuncture, and the extent to which needling style influences therapeutic outcomes in clinical trials, the SAR Board of Directors collaboratively prepared a White Paper in 2008, which identified gaps in knowledge underlying the paradoxes in AOM research and proposed strategies for their resolution through translational research. The SAR directors concluded and recommended that acupuncture treatments should be studied (1) "top down" as multi-component "whole-system" interventions, and (2) "bottom up," as mechanistic studies that focus on understanding how individual treatment components interact with and translate into clinical and physiological outcomes. They report that such a strategy, incorporating considerations of efficacy, effectiveness, and qualitative measures, will strengthen the evidence base for the complex intervention of acupuncture.[29]

In addition, while the integrity of most randomized controlled trials reflect scientific rigor, the evidence such trials generate rarely offers insight into usual care or real world practice in both Western and AOM clinics. SAR member and research systems expert Claudia Witt and colleagues from the U.S. and Germany examined the concept of comparative effectiveness research (CER). CER promises to support clinical decision-makers by generating evidence that compares the benefits and harms of the best care options. CER evidence is more generalized than the evidence generated by traditional RCTs and is better suited to inform treatment care decisions in the clinic.[30] CER uses a broader methodology, deviating from the strictly controlled RCT by adjusting design elements, such as outcomes, eligibility criteria, or treatment protocols to drive the creation of evidence that answers such fundamental questions such as "Which treatment is best?" and "Does the treatment have side effects that might affect colon cancer patients more than breast cancer patients?"

In her studies, Witt examines in detail the difference between "efficacy" and "effectiveness" in clinical research.[31] Many RCTs focus on the efficacy of a specific acupuncture point or point regimen on a specific set of subjects, (e.g., breast cancer patients between the ages of 25–55 receiving bi-weekly taxane chemotherapy). Subjects who do not fit the specific criteria are excluded, and this design is only feasible if done within the oncology clinic.

Effectiveness research studies examine the impact of the treatment on a broader group of patients with similar symptoms mimicking the conditions in most TCM clinics, (e.g., cancer patients with chemotherapy induced neurotoxicities). Effectiveness research requires a larger population of subjects for adequate statistics but also provides answers to questions on safety and effectiveness of treatments when used in real world situations. It should also be noted that treatment methods used by acupuncturists include an eclectic array of manual techniques, dietary strategies, exercise and mind mastery tools, herbal medications, and cognitive reframing philosophies.[32] Acupuncture was not classically meant to be used as a stand-alone treatment and would not have been used without tending to the patient's psychological state.

The Future of AOM in the U.S.

There has been unprecedented growth in the field of AOM in the U.S. during the past 30 years. Following the 1997 NIH consensus, there have been thousands of research studies conducted on the clinical and mechanistic effects of acupuncture and Chinese herbal treatments. NCCAM and other offices at the NIH are continuing to fund studies examining the effects of AOM.

Since the inception of the accredited DAOM program, more traditionally trained acupuncturists are gaining an interest in and respect for research. These new investigators are now collaborating with MDs and PhDs to design and conduct better acupuncture studies utilizing AOM treatment plans designed by AOM professionals with many years of clinical experience. Many investigators are designing treatment regimens based on a consensus of AOM clinicians with over 20 years of clinical experience.

Building on the lessons we have learned from previous AOM researchers and the continuing efforts of research experts who report on better ways to understand the complexities of studying a whole medicine system using Western methodological rigor, future AOM studies in the U.S. may begin to report

more meaningful results that can serve as evidence for use of these treatments in real-world clinics. Since the U.S. healthcare system relies on evidenced-based medicine, promising results in AOM evidence-based research ultimately should contribute to AOM treatments becoming standard of care for patients in the U.S.

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