NOMAA Curriculum Development

Introduction

Development of the NOMAA curriculum requirements for a 4,000 hour first-professional doctor of oriental medicine (OMD) degree has involved a concerted effort taken place over an extended period of time. This effort was undertaken by the oriental medicine profession to provide the public higher standards of care and ensure greater clinical success for graduate practitioners. The main goals have been to provide a standard that: 1) is consistent with the responsibilities dictated by applicable state and federal laws especially public interest law requirements to protect the public's safety and welfare; 2) is based on known and established anatomical, physiological, and medical principles; 3) is consistent with the historic foundations and present understanding of Chinese/oriental medicine; 4) ensures graduates will be able to communicate with the general health care profession using common medical terminology; 5) graduates will be able to diagnose and assess patient conditions in order to determine appropriate oriental medicine treatments or referral to other health care providers; and 6) ensures that graduates will be competent in the practice of oriental medicine and able to either enter private practice or be able to practice within an integrated medical setting. These standards have not previously been properly articulated by any other oriental medicine agency or professional organization.

The 4,000 hours total may seem arbitrary but is consistent with other first-professional doctor level training programs. Content of the total hours is more important to ensure that critical topics are given proper attention. Also, there may be some concern that only the States of Nevada (OMD), New Mexico (DOM), Rhode Island (Doctor of Acupuncture [DA]) and Florida (Acupuncture Physician [AP]) require a doctoral level training program for their licensure or certification. Nevada's 4,000 hour requirement is only met by the NOMAA standard; New Mexico's requirement is slightly less than 3,000 hours; and Rhode Island and Florida require 2,500 hours. However, California and many other states have primary care responsibilities within their scope of licensure, or are independent practitioners not requiring medical doctor referral for patients. This level of responsibility dictates that educational programs have to meet this high standard which would indicate the requirement for a first-professional doctor degree.

California has some 11,000 licensed oriental medicine practitioners which represents anywhere from 60 – 75% of the primary care practitioners in the United States. Consequently, the state of California has been in the forefront to continually improve educational standards to best serve the public's interest. Unfortunately, these efforts have been strongly opposed over the years by an existing accreditation body and their supporting organizations. In California the Council of Acupuncture and Oriental Medicine Alliance (CAOMA) represents most of the oriental medicine professional groups in the state. This organization was recognized by the California Acupuncture Board (CAB) to represent the voice of the profession on issues of education and regulation. The CAB eventually established a two and a half year Competency Task Force (CTF) effort to address possible improvements in educational standards in

California. CAOMA was responsible for finalizing and presenting the recommendations of the profession which had a range of about 3,000 hours to over 4,000 hours.

In 1998 the newly formed National Guild for Acupuncture and Oriental Medicine (NGAOM) Guild #62 of the Office and Professional Employees International Union (OPEIU) of the AFL-CIO joined the efforts to support improved educational standards. The NGAOM also sought to improve the utilization of oriental medicine practitioners in main stream medicine and areas controlled by the Federal government. It soon became obvious that the opposition to improving educational standards was so entrenched that a different approach had to be considered and this effort led to the formation of the NOMAA. The CAOMA became the professional support organization for NOMAA.

Background

The independent practice of oriental medicine in the United States was first legalized in Nevada in 1973 as doctor of oriental medicine (with OMD license designator). Nevada specified a 4,000 hour program basically derived from professional programs offered in Korea. Practice of acupuncture was legalized in California in 1975 (Certified Acupuncturist) to offer the public a low cost and effective alternative to conventional medicine for their health care options. However, prospective patients required a medical doctor referral. This arrangement did not result in sufficient referrals to ensure the public had adequate access to acupuncturists. Consequently, the law was changed effective January 1, 1980 to expand the scope of licensure to include primary care practice. In addition California law, unlike most other states, requires training and clinical practice to be based on science and physiology. Both of these requirements are specified in the California Business and Professions Code 4926 and 4927.d as follows (underline added for emphasis):

> 4926. In its concern with the need to eliminate the fundamental causes of illness, not simply to remove symptoms, and with the need to treat the whole person, the Legislature intends to establish in this article, a framework <u>for the practice of the art and science of oriental medicine through acupuncture.</u>
>
> 4927.d) "Acupuncture" means the stimulation of a certain point or points on or near the surface of the body by the insertion of needles to prevent or modify the perception of pain or <u>to normalize physiological functions</u>, including pain control, for the treatment of certain diseases or dysfunctions of the body and includes the techniques of electroacupuncture, cupping, and moxibustion.
>
> The purpose of this article is to encourage the more effective utilization of the skills of acupuncturists by California citizens desiring a holistic approach to health and to remove the existing legal constraints which are an unnecessary hindrance to the more effective provision of health care services. Also, <u>as it effects the public health, safety, and welfare, there is a necessity that individuals practicing acupuncture be subject to regulation and control as a primary health care profession.</u>

Once primary care status was established in California it was clear that educational standards needed to be improved. Several schools followed the lead of Nevada and created doctor of oriental medicine (OMD) degrees that were approved by the then California Board of Education (CBE). Later the CBE became the Bureau of Private Postsecondary and Vocational Education (BPPVE). Schools increased hours over and

above the State's minimum hours including additional training involving Chinese herbal medicine. These OMD degrees are still considered to be legal by the California BPPVE. Schools in other states, including New Mexico, also offered OMD degrees.

The profession at that time planned to follow the same process as taken by the medical doctors a little over 100 years before. They created the doctor of medicine (MD) degree because individuals with a doctor of philosophy (PhD) degree were given greater respect by being referred to as "doctor." Perhaps they thought it better to be called "doctor" rather than being referred to as "physician." Furthermore, their new professional MD degree did not require a dissertation. The MD program started by requiring only an additional 100 hours of training taught on weekends. Soon other health care providers created their own professional doctor degrees. The medical doctors continually improved their standards reaching a 4,000 program over a period of several years.

The oriental medicine profession's rational plan was derailed several years later when an accrediting agency was created for acupuncture and oriental medicine. The new agency only sought recognition for an academic Master's degree and prevented the schools from offering the OMD program as a condition for accreditation. As a consequence, all of the OMD programs were systematically eliminated. Seeking recognition for a Master's was probably the right choice for the time. However, not to allow the schools to provide education beyond the Master's level was unfortunate. This basically shut down academic freedom and kept the oriental medicine profession in the United States at a stand still for nearly twenty years. Meanwhile the profession understood that education standards must be continually improved to best serve the needs of the public. These turn of events engendered a major struggle and contentious battle within the oriental medicine profession, especially in primary care states like California. This eventually led to the California Acupuncture Board to empanel the CTF and the profession to seek legislative changes to improve educational standards.

In hind sight, the schools would have been better off if they had had the freedom to offer graduate programs beyond the Master's level. In addition, the professional organizations that went along with restricting education ended up supporting standards of only 2,600 hours which was well below the lowest level (3,250 hours) recommended by the CTF. To date, these organizations have chosen not to participate in the NOMAA process. Despite this, NOMAA has endeavored to seek and receive input and acceptance both within the narrow and wider definitions of this healthcare profession in the educational, vocational, and professional fields.

Physiological Understanding Required

NOMAA is the first accreditation body to offer programmatic criteria that is anatomically and physiologically based, and consistent with, the historic foundations, theory, and practice of Chinese/oriental medicine. This seems to be a dramatic paradigm shift from the popular but impossible idea of Chinese medicine being based on energy and blood circulating by means of invisible meridians. Hanging on to these metaphysical concepts is the reason why present training in oriental medicine has not seriously entertained biomedical science education and why oriental medicine is still not yet integrated into the mainstream of medicine. Fear or apprehension about physiologically based oriental

medicine may be contributing to some of the opposition to the NOMAA programmatic criteria.

The NOMAA standard is actually in the main stream of medicine including oriental medicine. These standards meet the National Institutes of Health (NIH) and the National Academy of Science (NAS) criteria for complementary and alternative medicine. Having a physiologically based oriental medicine program, NOMAA accredited schools would be able to qualify to receive research grants. The NOMAA standard also meets the requirements that would allow oriental medicine to be accepted into the Medicare system.

The NGAOM was invited to testify at the White House Commission on Complementary and Alternative Medicine Policy meeting of December 4th and 5th, 2000 concerning issues in integrating CAM into service delivery. Written testimony was submitted in addition to a verbal response to the Commission. One of the questions addressed in the written response was:

Given the significant (often conflicting) philosophical diversity among the multiplicity of schools or forms of acupuncture, how has OPEIU/the Guild contributed to the improved access to and delivery of not only acupuncture in particular, but also oriental medicine in general?

Answer to this is basically the same as the preceding information on the need to promote the real historic and physiological basis of Chinese/oriental medicine, including how needling therapy actually works. Chinese/oriental medicine represents a totally rational system that can be clearly articulated in modern physiological and biomedical terms.

Now that needling therapy (acupuncture) is being recognized as an evidentiary effective treatment approach, more medical professionals including medical doctors, veterinarians, and researchers are questioning the validity of the energy theories. Some researchers even note that most of the 10,000 (actual number today is closer to 20,000) acupuncturists in the United States, “Practice metaphysically explained ‘meridian theory’ acupuncture using needles to supposedly remove blockages of a hypothesized substance ‘Qi’ ” (Ulett, G. A., J. Han, and S. Han, 1998). This is recognized as the French energetic or energetic theory, involving “qi” (as energy) and blood circulating in body meridians developed by Soulie de Morant during the 1930 – 1950s (Soulie de Morant, 1957; Zmiewski, Paul, ed. 1994).

However, Schnorrenberger (1996) translates “qi” as “vital strength or breath” and notes that qi “is certainly not equivalent to the western term energy.” To the Chinese “qi” is the air breathed in from the atmosphere and circulated in the cardiovascular system. Chinese-English dictionaries give the meaning of this “qi” as: breath, air, steam, gas, weather (Mathews, 1931, p.74). It can also be used to denote manner, demeanor or temper and when used as the second character in a compound word it can mean function. Unschuld (2003) also translates “qi” as vapor or air.

Exposure to the West

The first European work on Chinese needling therapy was written by Girolamo Cardarno (1508 – 1576), a physician and medical teacher in Milan (Roccia, 1974). The first early western account on the anatomical and physiological basis Chinese medicine was provided by Willem ten Rhijne in 1683 (Carrubba and Bowers, 1974). He spent two years

working for the Dutch East India Company on a small island in Nagasaki Bay Japan. Ten Rhijne obtained four charts from local Chinese practitioners showing critical junctures on the superficial body used for needing therapy. The Chinese had a constructed a hydraulic device that illustrated how blood continually circulates inhaled air and nutrients throughout the body by means of the blood vascular system. The Chinese explained that nerves were involved as well and that a key part of the Chinese theory was the continued branching of larger vessels into smaller vessel to distribute blood out to the body. This information on progressive branching of blood vessels was not known in Europe at this time. Ten Rhijne conducted his own dissection studies to confirm this idea.

Ten Rhijne's dissertation on Chinese medicine was used by physicians in France, Italy, and the United States in the 1820s to experiment with Chinese needling therapy (acupuncture) (Cassedy, 1974). They even applied the first known use of percutaneous and transcutaneous electrostimulation (Sarlandiere le Chevalier, 1825; da Camino, 1834). One of the interesting discoveries was that some muscles would twitch in response to electrostimulation of certain superficial nodes on the body used in Chinese needling therapy. This observation eventually led to Hugo Zeimssen (1826 – 1902) and Wilhelm Erb (1840 – 1921) to discover neuromuscular attachments to skeletal muscles. However, by 1900 the analgesic effect of electrostimulation was no longer in vogue.

In 1901 Soulie de Morant first went to China and stayed for some 16 years. During that time he was involved in many pursuits one of them being Chinese needling therapy. He developed significant skills in the practice of acupuncture and basically spent the rest of his life practicing, teaching, researching, and writing about Chinese acupuncture after his return to France. He understood that nerves were somehow involved in therapeutic effect of needling the body and hoped that the pioneering work of Sir Thomas Lewis (1935; 1942) on sensory pain nerve fibers would result in verifying his meridian theory. Soulie de Morant's contribution to understanding the clinical application of needling therapy was monumental but the idea of replacing the Chinese blood circulation discovery with his energy-meridians concept hindered acceptance and understanding by the medical community. Later, he was even critical of ten Rhijne's work suggesting in was not correct. It is interesting to note that one can be taught to effectively apply Chinese needling therapy by learning the location and indications of the critical junctures (acupoints) without understanding the underlying anatomical features or physiological mechanisms involved in the response to needling.

Expert Consensus

The original Chinese concept involves the cardiovascular circulation of oxygen/carbon dioxide, nutrients, immune substances, and biologically active substances, including hormones. These ideas are completely consistent with present day understandings. Many expert sinologists do not understand why practitioners in Europe and the United States use the incorrect concepts of energy and meridians. This is especially true given the fact that energy (the noun) is a process and cannot circulate in anything. Furthermore, the energy theory itself is clearly not consistent with historical facts concerning the Chinese vessel and blood circulation theory (Harper 1998; Rickett 1998, p.99, 100; Kendall 2002, p.144-213). Unschuld (2003, p.370, n. 382) summarizes this apparent anomaly and the adherence to an obvious error as follows:

> The term "meridian" introduced by Soulie de Morant in his rendering of the concept of *jing*, has been adhered to ubiquitously in Western acupuncture literature, even though it is widely known that the concept of meridians does not parallel the significance of the historical concepts of *jing* … the adherence to the term "meridian" is one example among many others of what might be called a creative reception of Chinese medicine in Europe and North America in recent years that disassociates itself from the historical facts.

Other critics of the energy-meridian theory include Felix Mann who wrote numerous books in English that initially promoted these ideas. He now strongly refutes the meridian concept (Mann 1998). In addition, the National Institutes of Health consensus statement on acupuncture (1997) indicates that much confusion exists with respect to treatment approaches and research protocol. This confusion is the direct result of trying to apply the energy-meridian ideas over the past twenty years.

It is now generally agreed that medical training, including oriental medical education, should be competency-based, and students need to be taught to think critically, learn how to question the validity postulated concepts, and be able to do independent research. The NOMAA programmatic standards carefully addressed all of these concerns and requires competency based training, evidence methodology, as well as technical assessments to ensure students learn all the essential critical skills.

Improved Educational Standards Needed

The oriental medicine profession has been keenly aware that many graduates from some approved schools have difficulties in actually being successful in clinical practice. This problem has been more obvious in California where there are numerous schools and a large population of licensed practitioners. Many curricula elements are critical to verifying that students have learned required skills in order to enter practice upon graduation. These safeguards include competency based training and technical assessment standards. Students also have to develop skills in areas associated with an ongoing clinical practice such as evidenced-based medicine methodology. This is especially important if practitioners want to participate in research or be able to evaluate clinical studies for applicable information relative to their practice. These requirements are detailed in the NOMAA curriculum. Lack of these training requirements reflects on how well graduates can actually succeed in clinical practice upon graduation.

Surveys involving some 1,200 respondents (McNamee, in press [used with permission]) were undertaken by several groups to evaluate the adequacy of clinical training in acupuncture. Results of the studies indicate that a large percentage of graduates do not feel there are adequate hours required for training and/or do not feel adequately trained to practice independently. Others indicated the need to take post-graduate courses to improve clinical practice. One study involved a job task analysis (January 2002) and the other involved a survey of recent licensees (5 years) in California summarized as follow:

1. Job task analysis respondents reveal areas of needed academic and clinical training improvement:

   34.8% feel they were not prepared for the first year in private practice

77.7% have taken post-graduate courses to expand their training

27.6% of the Subject areas in post-graduate courses included Women's Health, Nutrition, Orthopedics, and Western Medicine

34.1% felt they were ineffectively trained to integrate standard medical reports and diagnostic exams into the patient's treatment plans and recommendations

2. Survey conducted with researchers from UCLA, USC and Southern California University of Health Sciences demonstrated key areas of increased training as follow:

   Areas of training which ranked none to Poor were:

   - History and Physical Exams
   - Laboratory and Diagnostic Imaging
   - Diagnosis (Except for the arrival at a Chinese Medicine diagnosis)
   - Physiotherapeutic Modalities
   - Business/Office Management

   38.2% of respondents felt the training was: Not Adequate or Somewhat Adequate

   45.6% of respondents felt at the conclusion of the internship they were: Not Adequately or Somewhat Adequately trained to practice independently.

The preceding survey information indicates that present training requirements for oriental medicine in the United States has significant shortcomings. One important omission is the lack of training requirement in orthopedics, or very inadequate training in this area. This is unfortunate since 75% of adult Americans suffer with low back pain and other painful conditions that are effectively treated with oriental medicine. Orthopedics including assessment, needling therapy, rehabilitation, bone setting, and surgery has been a recognized area of Chinese medicine since ancient times. All the skeletal muscles and their longitudinal organization were described as early as 200 – 100BCE in the Yellow Emperor Internal Classic (Kendall 2002, p.214-238). This ancient text provides pathology affecting the muscles including trauma, pain, low back pain, cramps, spasms, arthritis, rheumatism, and other conditions. Orthopedics is a key element in NOMAA's oriental medical sciences and should involve at least minimum of 250 hours of training.

Other critical improvement was to provide the correct physiological understanding of oriental medical sciences. This is the key requirement that allows graduates to understand the principles of oriental medicine explained in biomedical terms so students and graduates will able to converse with other medical specialties using commonly acceptable terms. The Chinese concepts and original discoveries of cardiovascular circulation of blood, inhaled atmospheric gases, nutrients, immune substances, and substances of

vitality (hormones and biologically active substances) replace the French energetic model. The study of the complete vascular system and its complex branching replaces the false meridian concepts.

Students are also required to understand the physiological mechanisms in how needling therapy (acupuncture) brings about restorative and healing processes involving tissue reactions, peripheral nerves, spinal cord tracts, the brain stem, and central nervous system (CNS) descending control processes. In addition, students learn a modern understanding of the Chinese concepts of physiological balance or homeostasis important in maintaining health and normal function. The relationship of the Chinese vitalities, endocrine glands, and resulting emotions also brings a physiological understanding of this important element of Chinese medicine.

Additional weak or deficient training areas that needed to be addressed in an OMD level program involve the area of clinical medicine which was given detailed attention in the CTF effort. One of the main topics include patient assessment and diagnosis which involves clinical science review, physical examination, history taking, communication skills, diagnostic analysis, and ordering of appropriate laboratory test. The other aspect of clinical medicine that needs to be addressed is case management including topics such as primary care responsibilities, psychosocial assessment, contraindications, possible complications including potential herb and drug interactions, treatment planning, report writing, and emergency medicine procedures.

One area of training that is basically accepted by the profession involves the minimum of 450 hours of training for herbal medicine. This is almost twice as many of hours required in the Chinese programs.

Initial Curricula Development Efforts

The process to develop a first professional OMD curriculum started in 1998 with the obvious starting point to look at what was being offered in the better oriental medicine schools in the United States. In addition, California and New York have many practitioners that graduated from schools in China and some individuals participating in the effort had either attended or had visited schools in China. Nevada also had practitioners that were educated in the schools in Korea. With a dozen schools already in California and perhaps almost forty more in the other states, the existing curricula for oriental medicine already had a known and useful structure. So the main question was to determine the required content additions and upgrades needed for each recognized category that would raise the standard to that of an OMD degree.

The curriculums of schools that already provide professional training at doctoral level or required doctor training were examined for states such as Nevada and New Mexico (See Table 1, Column 3). Rhode Island and Florida require 2,500 hours of training. The Nevada Oriental Medicine Board provided an input and this was discussed in detail with the Nevada practitioners. This program is basically the same as the Korean program which is a little similar to the Chinese school programs. The curriculum of one of the larger schools in California (See Table 1, Column 4) that offers a masters degree was analyzed as well as that of a new school (See Table 1, Column 5) not in the state of California. Input was also sought from other existing schools that offer a master’s degree in Oriental medicine.

China and Korea are the only two countries that have a long history of providing oriental medical training that meets a professional doctor level. The Chinese schools have been in existence for some 40 years. These excellent institutions are considered the world gold standard for oriental medicine. The current curriculum of the Beijing (See Table 1, Column 8) and Chengdu (See Table 1, Column 9) schools were taken as being representative of the 28 or more major schools in China. The curriculum for South Korea professional schools was reviewed as well.

The core curriculum of the Chinese schools provides a good general comparison with NOMAA (See Table 1, Column 7) after subtracting introductory and prerequisite training. However, there are many demands on practitioners in the United States that are more rigorous and usually required by appropriate state laws. This concerns use of acceptable uniform diagnostic approaches, record keeping, patient referral, meeting certain competencies, and participation in government programs or insurance reimbursement. Hence, all procedures and standards appropriate to a professional doctor of oriental medicine training program and practice need to be consistent with acceptable standards of medical care in the United States. Other problems in comparing the Chinese schools is the unlikely fact that bone setting and surgery would be included in oriental medicine training in the United States anytime in the near future, unless a clear need eventually develops.

Competency Task Force

During the ongoing process of curriculum development, the State of California became involved in a contentious battle with same accrediting body and their supporting organizations that have sought to prevent improving educational standards in the United States. The California Acupuncture Board (CAB) was well aware of the fact that recent graduates had difficulty in actually being able to make a living as a Licensed Acupuncturists (McNamee, in Press). At this time the CAB training requirements were only 2348 hours (See Table 1, Column 1) while most schools were actually requiring more than 3,000 hours for the Master's degree (See Table 1, Column 4). Basically the schools were offering about 700 hours of unregulated training.

It was clear to the CAB and the profession that training standards had long required to be upgraded. This end the CAB impaneled a Competency Task Force (CTF) effort involving many organizations, including the opposing agency and organizations, and oriental medicine schools to recommend improvements for California's educational standards. The NGAOM and NOMAA representatives also participated in the CTF. Consequently, the CTF effort was represented by the principal National and school organizations. The results of the CTF represent a national consensus on a range that could include a Master's degree (3,251 hours) to a professional doctoral program (4,050 hours). The recommended content of each curricula category was most important in deciding specific requirements to correct educational deficiencies. These for the most part were incorporated into the NOMAA curriculum.

The two and one half year California CTF effort resulted in recommendations ranging from 3,251 to 4,050 (See Table 2, Columns 1 and 2) hours for training in acupuncture and oriental medicine, with an average of 3,648 hours (See Table 1, Column 6). More debate then ensued when the opposition hired a lobbyist to prevent California in adopting

a change in hours. The state of California finally legislated (Senate Bill 1943) increasing training requirement to 3,000 hours effective as of January 1, 2005. The CAB also recommended that the training hours be increased to 4,000 hours sometime in the future.

Table 1. Comparison of NOMAA standards with professional training in oriental medicine.

	1	2	3	4	5	6	7	8	9
	CA pre SB 1943	Recom. SB 1943	NM	CA School	Non CA School	CTF Ave. (3)	NOMAA	Beijing (4)	Cheng Du (4)
Biology	X	X	75	44				P.R.*	P.R.
Chemistry (inorganic and organic)		X	75						
Physics	X	X		33				P.R.	
Anatomy	X	X	75	64	90		X	90	96
Physiology	X	X	75	64	90		X		72
Endocrinology				44			X		
Medical Biochemistry	X	X	60	33	72		X	117	72
Medical Microbiology			75				X	45	54
Neuroanatomy				44			X		
Embryology								45	36
Parasitology								18	
Pathology & Pathophysiology	X	X	90	88	120		X	90	72
Psychology	X	X	45	33	24		X		
Nutrition (including vitamins)	X	X	45	44	36		X		
Pharmacology		(1)		44	24		(1)	45	72
Botany/Pharmacognosy		X			24		(2)		
Biomedical Science Total	400	350	615	535	480	499	500	450	474
Oriental Medicine	660	805	705	900	744	950	950	936	1004
Herbal Medicine	300	450	450	395	372	450	450	207	198
Clinical Medicine & Other	188	400		385	316	622	600	324	330
Clerkship	800	950	900	840	912	1075	1440	2240	1920
Electives		45				52	60		
Total Program Hours	2348	3000	2670	3055	2844	3648	4000	4157	3926

Notes for Table 1:

* P.R. = prerequisite

1. Included in clinical medicine and case management studies in the form of pharmacological assessment and drug and herb interactions, respectively.

2. Included in herbal medicine study.

3. California Competency Task Force efforts range from 3,251 to 4,045 hours with average of 3,648 hours (See Table 2).

4. Program accepts students from high school and hours related to introductory training, prerequisites, and non-credit electives subtracted to provide true comparison with other schools and programs. Hours for surgery, emergency care, and radiology also deleted, resulting in average of 4,042 hours for both schools.

Final NOMAA Curriculum

It was important that NOMAA consider the use of the CTF information in finalizing the curriculum for a first professional OMD that would also address all existing shortcomings in oriental medicine training as previously mentioned (see: Improved Educational Standards Needed). Clear attention was paid to the specific categories of the curriculum

so there would be a good correspondence with the CTF findings. This resulted in new national programmatic standard for a first professional OMD that has not been previously offered.

Considering that competencies are needed to support primary care practitioner training it seemed essential that the 4,000 hour level was more appropriate to a first professional level OMD program. These hours consist of 2,500 hours of didactic training and 1,500 hours for the clinical clerkship phase. The state of Nevada established the 2,500 hour minimum requirement for the didactic portion of the program. There is excellent comparison of the NOMAA standard to the CTF 4,050 hour recommendation (See Table 2, Column 2). In addition, the NOMAA standard requires entering students to have completed at least three years college training with about 500 hours of prerequisite courses.

The present California requirement and the upgrade to 3,000 hours after California Senate Bill 1943, the requirements of New Mexico, training levels in one top California school and another non-California school, as well as the CTF average hours, NOMAA, Beijing school, and Chengdu school are all summarized and compared in Table 1.

The CTF effort in California resulted in range of hours as listed in Table 2, the average of which is noted in Table 1, Column 6. The comparative information is summarized in Table 1 which shows the NOMAA requirement is consistent with CTF average except for the clerkship effort which is higher, but is consistent with the clerkship recommended by the CAOMA. The clerkship includes practice management electives. The NOMAA requirement also compares well with the selected Chinese schools except Chinese clerkship is higher while NOMAA requirements for clinical medicine and herbal medicine are higher than the Chinese schools.

Table 2. Comparison of the low and high CTF range with CAOMA recommendation, average of Beijing and Chengdu schools, and NOMAA 4,000 OMD curriculum

	1	2	3	4	5
Curriculum Topics	CTF Low	CTF High	CAOMA	Chinese Average	NOMAA OMD
Prerequisites				(475)*	(500)*
Basic Sciences	423	575	500	462	500
Oriental Medical (OM) Sciences	850	1050	1000	970	950
OM Theory and Principles					200
Needling Therapy (Acupuncture)					250
Internal & General Medicine					250
External Medicine & Orthopedics					250
Herbal Medicine	450	450	500	202	450
Clinical Medicine	533	710	675	327	600
Patient Assessment & Diagnosis	285	415	400		340
Case Management	125	150	150		140
Evidence Based Medicine	45	55	50		50
Public Health	78	90	75		50
Clinical Clerkship	995	1260	1450	2080	1500
Clinical Observation					160
Supervised Practice 1					300
Supervised Practice 2					300
Monitored Practice					680
Electives (Practice Management)	45	60	50		60
Total Program Hours	3251	4,045	4,125	4042	4,000

*Hours in parenthesis not included in the total hours.

Comparison of the NOMAA 4,000 hour curriculum shows excellent agreement with the Chinese school requirements. The schools located in Beijing and Chengdu China was selected since they are typical of the current standards of other schools throughout China. When all the hours are compared on the same basis the Beijing and Chengdu schools have 4,175 and 3,974 hours respectively (See Table 3).

Chinese schools accept students directly from high school where they receive introductory and prerequisite training that is somewhat equivalent to two years college before the study of Chinese medicine. Certain other courses would be considered as non-credit elective toward the OMD degree. So, these didactic hours are subtracted from their original total for a one-for-one comparison. There is close agreement in prerequisite training, biomedical sciences, and oriental medical sciences. The main differences are in herbal medicine of 450 hours for NOMAA while the Beijing and Chengdu schools offer 207 and 198 hours respectively and in clinical medicine with 600 hours for NOMAA compared to 324 and 330 hours for Beijing and Chengdu. The lower number in herbs may be the result of a strong emphasis on this area in the Chinese clinical clerkship program. Differences in the clinical clerkship of 2,240 and 1,920 hours for Beijing and Chengdu compared with 1,500 hours for NOMAA are due to injection therapy, surgery, obstetrics, and bone setting being included in the Chinese program. Presently, three or four states already allow injection therapy and so consistent standards need to be established for this area.

The 4,000 hours program needs to be completed to receive the first professional OMD degree. However, provisions are to be made to allow present licensees or certified practitioners, and graduates with Master's in oriental medicine or acupuncture to enter the program to take the additional training to complete the full OMD requirements. Postgraduate internships could be offered to cover training standards in those states that approve additional procedures, such as injection therapy. Bone setting, minor surgery, and other internship training could possible be offered in the future if there is a demonstrated need. Possible candidate internship programs are noted at the end of Table 3 compared with the Chinese schools.

Table 3. Comparison of NOMAA 4,000 curriculum standards with the professional Chinese medicine colleges in Beijing and Chengdu.

1	2		3	
4,000 hour OMD NOMAA Standard	**Beijing, China**		**Chengdu, China**	
	Introductory Training			
90 semester or 120 quarter units of college level training including prerequisite courses. Approximate hours not including the prerequisite classes: *Hours in parentheses not included in the total hours **(Approximately 850 hours)***	Basic Law	36	Basic Law	36
	General Ethics	18	General Ethics	18
	Revolutionary History	54	Chairman Mao's Theory	32
	Marxist Philosophy	54	Politics & Policy	122
	Contemporary Capitalism	54	Philosophy	54
	Socialist Construction	54	Economics	36
	Physical Education	144	National Defense	36
			Physical Education	140
	(360 hours)		**(474 hours)**	

Prerequisites					
English		Foreign Language	288	Foreign Language	280
Humanities		Biology	90	Advance Mathematics	48
Biomedical Sciences		Medical Biology	45	Biology	48
		Biomedical Physics &		Medical Biology	48
		Electrical Engineering	54	Data Base	48
(500 hours)		**(477 hours)**		**(472 hours)**	
Biomedical Sciences					
Anatomy		Anatomy	90	Anatomy	96
Physiology		Pathology	90	Physiology	72
Pathology and pathophysiology		Medical biochemistry	117	Pathology	72
Immunology		Medical microbiology	45	Medical biochemistry	72
Endocrinology		Embryology	45	Medical microbiology	54
Medical biochemistry		Parasitology	18	Embryology	36
Medical microbiology Neuroanatomy		Pharmacology	45	Pharmacology	72
Behavioral medicine					
Nutrition (Including vitamins)					
Pharmacology (1)					
Botany/ Pharmacognosy (2)					
500 Hours		**450 Hours**		**474 Hours**	
Oriental Medical Sciences					
Oriental Medicine Theory	200	CM** Basic Theory	90	CM Basic Theory	80
Historic & Literature Background		CM Diagnostics	99	CM Diagnostics	90
Current Physiological Basis		Acupuncture Pathways	63	Acupuncture Theory	108
Vitality & Endocrine Glands		Acupuncture Nodes	90	Acupuncture Laboratory	64
Pathogenic Model		Needling Techniques	72	Acupuncture Treatment	96
Diagnosis		Acupuncture Laboratory	90	CM Dermatology	54
Needling Therapy (Acupuncture)	250	Acupuncture Treatment	144	CM Gynecology	54
Distribution Vessels		CM Internal Medicine	36	CM Internal Medicine	144
Neurovascular Nodes (Acupoints)		CM Gynecology	54	CM Pediatrics	54
Physiological Basis of Needling		CM Pediatrics	36	CM Ophthalmology	36
Node Laboratory		CM Orthopedics	63	CM Orthopedics	72
Needling Techniques		Massage	99	Massage Theory	72
Needling Therapeutics				Massage Treatment	80
Internal & General Medicine	250	**Chinese Medicine		CM Emergency Care	48
Pediatrics					
Geriatrics					
Ophthalmic Disorders					
Gastrointestinal Disorders					
Gynecology					
Reproduction Disorders					
Respiratory Diseases					
Hepatic Disorders					
Cardiovascular					
Renal Disorders					
Immune System Conditions					
Endocrine System Problems					
Vitality & Emotions					
Affective Behavior					
Substance Withdrawal					
Emergency Care					
Orthopedics	250				
Chinese Muscular Distributions					
Assessment & Treatment					
Electroacupuncture & PENS					
Head, Face & Neck Problems					
Shoulder Problems					
Upper Extremity Problems					
Body Trunk & Thoracic Spine					
Low Back & Pelvis Problems					
Hip & Lower Extremity Problems					
950 hours		**936 hours**		**1052 hours**	

Herbal Medicine		
Botany/Pharmacognosy Herbal Medicine Physiological Effect & Nature Toxic Effects & Contraindications Therapeutic Properties of Most Commonly Used Herbs Herbal Formulary Principles of Combining Herbs Preparation of Formulas Herbal Pharmacy Internship Most Commonly Used Formulas Clinical Application of Herbal Medicine **450 hours**	Herbal Medicine 108 Herbal Formulary 99 **207 hours**	Herbal Medicine 108 Herbal Formulary 90 **198 hours**
Clinical Medicine		
Assessment & Diagnosis 360 Clinical Science Review Practice of Medicine Survey Standard Physical Examination Comprehensive History Taking Pharmacological Assessment Diagnostic Analysis (ICD-9) Laboratory Tests & Diagnostic Imaging Patient Rapport & At Risk Population Awareness Case management 140 Primary, Secondary & Specialty Care Responsibilities Psychosocial Assessment Treatment Contraindications Interactions of Drugs & Herbs Reports, Testimony & Medical Review Special & Emergency Care Evidence based methods 50 Public health 50 **600 hours**	Basic Western Diagnosis 144 Western Internal Medicine 26 Western Neurology 36 Medical Ethics 18 **324 hours**	Basic Western Diagnosis 90 Western Internal Medicine 90 Western Neurology 96 Medical Ethics 54 **330 hours**
Clinical Clerkship		
Clinical Observation 160 Supervised Practice 1 300 Supervised Practice 2 300 Monitored Practice 680 Electives 60 **1500 hours**	Clinical Rotations 400 One Year Internship (3) 1840 **2240 hours**	One Year Internship (3) 1920 **1920 hours**
Non-Credit Electives		
Medical Statistics Medical Specialties Research Methods Huangdi Neijing Shang Han Lun Wen Bing Jin Gui Qigong	Medical Statistics 36 Classical CM Literature 126 Shan Han Lun 72 Qigong 45 **(279 hours)**	Medical Statistics 36 CM Literature Research 36 Acupuncture Literature 48 Jin Gui 36 Wen Bing/Shang Han Lun 90 Huangdi Neijing 54 **(300 hours)**
OMD Graduate Curriculum		
4,000 hours	**4,157 hours**	**3,974 hours**

Possible future goals	Post Graduate Internship			
Injection Therapy Includes didactic and clinical internship	200	Training covered in the clerkship program		Training covered in the clerkship program	
Radiology & Bone Setting Includes didactic and clinical internship	200	Training covered in the clerkship program		Radiology Plus additional hours covered in the clerkship program	36
Surgery Includes didactic and clinical internship	300	Western Surgery Plus additional hours covered in the clerkship program	63	Western Surgery Plus additional hours covered in the clerkship program	63

*Hours and courses contained in parentheses are not included in the total hours.
(1) Included in clinical medicine and case management studies as pharmacological assessment, and drug and herb interactions, respectively.
(2) Included as a stand-alone course in herbal medicine study.
(3) Clinical clerkship includes surgery, bone setting, and emergency care not in core curriculum of OMD program but may be possibly studied in United States schools as future postgraduate internships if and when there is a demonstrated need.

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