

# Results of a survey on educational and research programs in complementary and alternative veterinary medicine at veterinary medical schools in the United States

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**Objective**—To document educational and research programs in complementary and alternative veterinary medicine (CAVM) at US veterinary schools and to develop recommendations for additional curriculum development and research in these modalities.

**Design**—Mail questionnaire.

**Sample Population**—Deans, curriculum committees, and interested faculty at US veterinary schools.

**Procedures**—Questionnaires were mailed to personnel at all 27 US veterinary schools. Nonrespondents received a follow-up letter and telephone contact. Information was used to establish the current status of CAVM.

**Results**—Responses were received for 41 of 120 (34%) questionnaires. Responses were received from 23 of 27 veterinary schools, but number of respondents varied at each institution (range, 1 to 4) and some surveys were not complete. Seven of 27 US veterinary schools had an educational program in CAVM. Thirty-six (87%) respondents believed that acupuncture, nutraceuticals, nutritional supplements, and physical therapy should be included in the curriculum, 25 (61%) indicated that botanical (herbal) medicine should be included, and 25 (61%) believed that chiropractic should be included. Only 17 (44%) respondents believed that homeopathy should be included. The majority of respondents believed that CAVM should be offered as elective courses. Research in CAVM has been conducted at 6 responding schools.

**Conclusions**—Currently, few veterinary schools offer educational or research programs in CAVM. Veterinary schools are aware of the interest in CAVM and acknowledge a lack of educational and research programs in these areas. More veterinary schools are in the process of developing educational and research programs in various aspects of CAVM. (*J Am Vet Med Assoc* 2000;216:502–509).

Interest in complementary and alternative therapies (also known as integrative medicine) in human medicine has increased rapidly during the past few years. In

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a recent report<sup>1</sup> from the American Association of Medical Colleges, it is acknowledged that it is important for physicians to be “sufficiently knowledgeable about traditional and nontraditional modes of care to provide intelligent guidance to their patients.” This interest is mirrored by a rapid increase in interest in complementary and alternative veterinary medicine (CAVM) by the public and people within the profession of veterinary medicine. Clients increasingly seek to identify veterinarians who are trained in conventional veterinary medicine and who also are knowledgeable about the value and limitations of CAVM. The increased interest by the public has been detected by veterinary students as well. In a 1997 poll of the sophomore class of the College of Veterinary Medicine at the University of Florida,<sup>2</sup> 68 of 80 students expressed an interest in taking an elective introductory course in CAVM.

On the basis of these factors, it is prudent for veterinary schools to develop introductory and advanced educational, training, and research programs in CAVM. A challenge issued to many US veterinary schools is to move toward the establishment of a more progressive approach to CAVM in the areas of veterinary medical curriculum and research. Institutional support is necessary to create and maintain viable and sustainable academic programs. Similar to the situation in human medicine, the discussion about the best ways to prepare future veterinarians for a role in providing CAVM has just begun.<sup>3</sup> Similar to most newly defined challenges, there is a need for interdisciplinary discussion and development of a strategically planned approach to address the issues. Veterinarians will increasingly be expected to responsibly advise clients who request the use of CAVM for their animals. Development of an appropriate veterinary curriculum and research programs are necessary to address this increasing demand.

The AVMA adopted the most current version of its Guidelines for Alternative and Complementary Veterinary Medicine in 1996.<sup>4</sup> In those guidelines, it is indicated that the use of these modalities is considered to constitute the practice of veterinary medicine and that it is incumbent on veterinarians to pursue education in the proper use of these modalities. The objectives of the study reported here were to document the

prevalence, scope, and diversity of veterinary medical education in CAVM and to develop steps for evaluating and integrating educational and research programs in CAVM at schools of veterinary medicine.

## Materials and Methods

A questionnaire consisting of 33 multiple-part questions was developed for use in collecting information on the current status, interest, and concerns regarding CAVM in veterinary schools. The major topics in the questionnaire included the following 4 areas: courses in CAVM currently being offered at the school, planned or proposed courses in CAVM, research in CAVM currently being conducted, and planned or proposed research in CAVM. Subcategories included questions regarding the number and type of courses in CAVM and whether the students received credit for those courses. Other questions included the number of faculty members trained in specific areas of CAVM and areas of CAVM in which research was being conducted. Challenges regarding CAVM educational and research programs were also evaluated.

Questions addressed treatment modalities not typically taught in veterinary schools including acupuncture, chiropractic, botanical medicine, physical therapy, nutritional supplements, and homeopathy. Questions addressed the current status of educational and research programs in these modalities as well as future plans at each veterinary school.

Questionnaires were sent to 120 faculty members at each of the 27 US veterinary schools. Questionnaires were addressed to deans and members of curriculum committees, but additional questionnaires also were sent to specifically identified faculty members who were believed to have an interest in CAVM; although this was a nonrandom sample, it was intended to provide the broadest, most extensive input for evaluation of CAVM. The subset of interested faculty members included people who had some knowledge of CAVM and had completed at least 1 basic course in CAVM.

Questionnaires were mailed in November 1997. Follow-up letters were sent in February 1998 to those who had not responded, and telephone calls and e-mails were sent in June 1998 as a final encouragement to those who had not responded. Additional meetings with interested faculty members, deans, and members of curriculum committees at veterinary schools were arranged to discuss the programs at their respective schools.

## Results

**Respondents**—Questionnaires were sent to 120 deans or faculty members at the 27 US veterinary schools. Forty-one (33%) questionnaires were completed and returned. Responses were obtained from 23 of the 27 US veterinary schools.

Additional information for 1 nonresponding veterinary school was obtained from another source.<sup>a</sup> It was indicated in that report that a faculty member at that school was offering an elective course in CAVM and was conducting research on the effect of acupuncture in horses with respiratory problems.

**Courses offered in CAVM**—None of the 23 responding US veterinary schools currently had a required course consisting entirely of CAVM. Two schools had required courses that contained 1 or more lectures on CAVM, such as a lecture on acupuncture during a required course on anesthesia. Nine veterinary schools, including the 2 with lectures during required courses, offered elective courses (for credit or on a non-credit basis) in CAVM (Table 1). Courses

consisting entirely of CAVM currently were offered only as electives. Elective courses taken for credit were usually only 1 credit each. These elective courses were typically a general introduction to CAVM or an introduction to veterinary acupuncture. Instruction in CAVM was primarily in didactic courses but also was included in clinical situations.

Various CAVM modalities were, at the least, introduced during a required or elective course. Respondents stated that lectures or entire courses included acupuncture (12 schools), nutritional supplements (9), physical therapy (9), homeopathy (7), botanical medicine (3), and chiropractic (4). The aforementioned information<sup>a</sup> for the 1 nonresponding school indicated provision of an elective course on acupuncture.

Veterinary schools have integrated CAVM into their curricula to varying degrees. Colorado State University had one of the broadest programs in CAVM, offering an elective course (worth 1 credit). Faculty members at Colorado State University also integrated introductory lectures on CAVM into courses in the required curriculum. For example, lectures on the neurophysiologic basis of acupuncture were included in the physiology course, and pharmacologic characteristics of various herbal products and nutritional supplements were discussed during the pharmacology course. Colorado State University provided clinical service in the area of veterinary acupuncture. One key to establishing programs in CAVM is having adequately trained faculty on staff. Colorado State University had a number of faculty who were interested in CAVM, including the area of nutritional supplements and nutraceuticals, as well as faculty certified in veterinary acupuncture and veterinary chiropractic. The school also developed a postgraduate program in CAVM, which included a 2-day introductory seminar and a comprehensive 120-hour training program in veterinary acupuncture.

Cornell University offered a non-credit elective course in veterinary acupuncture; this course had been offered for the preceding 4 years. Cornell University also established a complementary therapy equine sports medicine clinic. The University of Pennsylvania offered introductory lectures on acupuncture as part of the required course in anesthesiology. Three faculty members at that institution were trained in veterinary acupuncture. The University of Florida offered an elective 1-credit course in CAVM. The course outline, research assignments, and student comments have been reported elsewhere.<sup>2</sup> The University of Florida had a full-time faculty position in complementary medicine, and the school developed a neurology Web site, with CAVM included as options for neurologic conditions. Tufts University had clinical rotations in veterinary acupuncture for large and small animals. Additionally, the school offered a 1-credit course in veterinary acupuncture. The University of Minnesota offered postgraduate continuing educational programs in CAVM. The Ohio State University had 1 faculty member trained in veterinary acupuncture and offered an elective 1-credit course in veterinary acupuncture. Tuskegee University periodically offered an elective course in veterinary acupuncture.

Table 1—Results of a survey on courses in complementary and alternative veterinary medicine (CAVM) currently offered or proposed at the 27 US veterinary medical schools

Veterinary school	Part of required course	Separate elective course	Proposed separate required course	Proposed separate elective course
Auburn University (1)	N	N	N	N
University of California-Davis (1)	N	N	N	N
Colorado State University (3)	Y	Y	N	N
Cornell University (3)	N	Y	N	N
University of Florida (4)	N	Y	N	N
University of Georgia (1)	N	N	N	Y
University of Illinois-Urbana (1)	N	N	N	N
Iowa State University (3)	N	Y	N	Y
Kansas State University (4)	N	N	N	N
Louisiana State University (1)	N	N	N	N
Michigan State University (0)	N	Y*	NR	NR
University of Minnesota (2)	N	N	N	Y
Mississippi State University (0)	NR	NR	NR	NR
University of Missouri (0)	NR	NR	NR	NR
North Carolina State University (1)	N	Y	N	Y
The Ohio State University (1)	N	Y	N	Y
Oklahoma State University (0)	NR	NR	NR	NR
Oregon State University (1)	N	N	N	N
University of Pennsylvania (3)	Y	Y	N	N
Purdue University (1)	N	N	N	N
University of Tennessee (1)	N	N	N	N
Texas A&M University (2)	N	N	N	N
Tufts University (3)	N	Y	N	N
Tuskegee University (1)	N	Y	N	N
Virginia Tech and University of Maryland (1)	N	N	N	Y
Washington State University (1)	N	N	N	N
University of Wisconsin-Madison (1)	N	N	N	N
<b>Total (41)</b>	<b>Y = 2 N = 22</b>	<b>Y = 10* N = 14</b>	<b>Y = 0 N = 23</b>	<b>Y = 6 N = 17</b>

\*Includes information obtained from a source<sup>a</sup> other than the survey.  
 Numbers in parentheses indicates No. of respondents from that school.  
 NR = No response.

**Future plans for CAVM courses and curriculum**—Responses indicated that of the 14 US veterinary schools currently offering instruction in CAVM, personnel at 5 of them planned to expand instruction. Personnel at 4 institutions that don't currently offer instruction indicated that there are plans to initiate instruction. Only personnel at 4 institutions that don't offer CAVM education or training indicated that there are no plans to do so.

Personnel at Oregon State University indicated an interest in developing a program in veterinary physical therapy, those at Iowa State University were interested in developing educational programs in veterinary acupuncture, and those at the University of Florida were interested in expanding the teaching program in CAVM. Personnel at the University of Minnesota, North Carolina State University, and Virginia Tech and University of Maryland planned to develop elective courses within the next year. All 3 of those schools planned to offer an elective course in CAVM in 1999. Furthermore, the University of Minnesota was interested in hiring additional faculty trained in CAVM.

Members at other schools voiced interest in developing programs but had not taken active steps to initiate programs. Nine respondents stated that they hoped their institutions would eventually offer instruction in acupuncture. Five stated they hoped their schools would add instruction in veterinary chiropractic, nutritional supplements, or physical therapy, and 3 hoped to add botanical medicine and homeopathy to their curriculum. Nine respondents indicated that the proposed instruction would be via elective

courses, and 1 indicated it would include elective and required courses.

Other comments on future plans for CAVM included plans at 1 school to expand a course on CAVM from 1 to 2 credits. One school planned to offer exposure to veterinary acupuncture during the large animal medicine clinical rotation. One faculty member stated that student exposure at their school was limited to a survey course on CAVM and to exposure in clinical rotations; further expansion of CAVM at that institution would have to be through postgraduate continuing education. Two respondents stated that there were plans at their schools to expand an elective course and to offer the expanded course for credit. Two other respondents reported plans for their schools to offer noncredit elective courses. Four respondents stated that there would be additions to current didactic courses, and 6 stated that there would be additional training during clinical rotations. Areas for additional training included CAVM in general, veterinary acupuncture, physical therapy, veterinary chiropractic, and nutritional supplements. None of the respondents stated that there were plans to decrease the amount of education or training for CAVM; however, 1 respondent indicated that their school currently does not plan to expand training in CAVM because of a restriction of funds and lack of time in the curriculum.

Respondents from Colorado State University indicated that their administration was interested in developing a center of excellence in CAVM. They believed that this decision was supported by the majority of faculty at that school.

Of the 41 respondents, 33 (87%) indicated that veterinary acupuncture should be included in the veterinary medicine curriculum. A similar number believed that nutraceuticals, nutritional supplements, and physical therapy should be included as well. Twenty-five (61%) believed that botanical (herbal) medicine should be included, but 5 (11%) disagreed. Twenty-five (61%) indicated that veterinary chiropractic should be included, but 8 (19%) disagreed. Only 17 (41%) believed that homeopathy should be included, whereas 9 (22%) disagreed on the inclusion of homeopathy.

Most respondents believed that all CAVM should be offered as elective courses in veterinary schools. This included veterinary acupuncture (34, 89%), veterinary chiropractic (24, 66%), botanical medicine (23, 62%), physical therapy (30, 83%), nutritional supplements (28, 77%), and homeopathy (19, 57%). The majority (mean of 58% for all modalities listed on the questionnaire) of respondents also believed that an elective clinical rotation would be beneficial. Furthermore, the majority (47 to 58%, depending on the specific modality) of respondents believed that training in CAVM should be offered as a postgraduate course. A minority (3 to 38%, depending on the specific modality) believed that CAVM should be offered during didactic basic science courses.

Finally, an important additional comment provided by many respondents indicated that the inclusion of CAVM in the veterinary school curriculum was needed so that veterinarians would, at the least, be aware of various modalities and to whom they could refer a patient should a client request a referral for treatment with CAVM.

Limitations for the development of educational

programs in CAVM were examined. Insufficient number of appropriately trained faculty (8 of 10 respondents ranked this in the top 3) and lack of time in the curriculum (8 of 10 respondents ranked this in the top 3) were the most common reasons cited for the lack of training programs in CAVM. Although many respondents indicated a lack of time in the curriculum for full training in these modalities, they did believe that introductory-level elective courses would be appropriate. Insufficient funding also was considered a major restriction, and substantial skepticism by a few colleagues also was a concern.

Types of postgraduate training programs that should be offered in CAVM were evaluated. The questionnaire specifically inquired about the possibility of internship and residency programs, Masters and Doctoral degree programs, and postdoctoral fellowships, as well as certification programs not associated with accredited schools of veterinary medicine. Thirty-three respondents provided answers, and the majority (24 ranked this in the top 3) preferred that veterinarians currently obtain training in CAVM via certification programs not associated with accredited schools of veterinary medicine. A major concern listed about that type of training was the quality of the various certification programs. The next preference was for residency programs (19 ranked this in the top 3) and internship programs (18 ranked this in the top 3), followed by Masters degree programs (11 ranked this in the top 3), postdoctoral fellowships (14 ranked this in the top 3) and Doctoral degree programs (5 ranked this in the top 3) in specific areas of CAVM.

Research in CAVM—Information was collected

Table 2—Results of a survey on research in CAVM currently being conducted or planned at the 27 US veterinary medical schools

Veterinary school	Currently conducting research	Proposed research
Auburn University	N	N
University of California-Davis	N	N
Colorado State University	Y	Y
Cornell University	N	Y
University of Florida	Y	Y
University of Georgia	N	Y
University of Illinois-Urbana	N	N
Iowa State University	N	N
Kansas State University	N	Y
Louisiana State University	N	N
Michigan State University	Y*	NR
University of Minnesota	N	Y
Mississippi State University	NR	NR
University of Missouri	NR	NR
North Carolina State University	N	N
The Ohio State University	N	N
Oklahoma State University	NR	NR
Oregon State University	Y	Y
University of Pennsylvania	Y	Y
Purdue University	N	N
University of Tennessee	N	Y
Texas A&M University	Y	Y
Tufts University	Y	Y
Tuskegee University	N	N
Virginia Tech and University of Maryland	N	N
Washington State University	N	Y
University of Wisconsin-Madison	N	N
<b>Total</b>	<b>Y = 7* N = 17</b>	<b>Y = 12 N = 11</b>

See Table 1 for number of respondents and key.

about research in CAVM being conducted at US veterinary schools (Table 2). Respondents at only 6 schools had conducted research involving CAVM. Faculty members at Colorado State University had conducted research on the use of nutraceuticals and on the use of acupuncture in animals. Investigators at Cornell University had conducted research on the use of veterinary chiropractic in animals. One respondent had conducted > 10 studies, 1 had conducted 3 to 5 studies, and 5 had conducted 1 or 2 studies. Three respondents had conducted studies on acupuncture, 3 on nutraceuticals, and 1 on physical therapy. In addition, information for the aforementioned nonrespondent indicated that the person was conducting research on acupuncture in horses.<sup>a</sup>

Twenty (56%) respondents indicated that they did not have plans for conducting research in CAVM, but the other 16 (44%) indicated they had plans to conduct research on CAVM. The most common response was planned research in veterinary acupuncture, although research in nutraceuticals and nutritional supplements, botanical medicine, veterinary chiropractic, and physical therapy also were planned. It is interesting that despite the low number of respondents to this question, numerous ideas for future research were proposed, including use of acupuncture for the following: pain management in animals, head shaking in horses, postoperative ileus in horses, pedal circulation in horses, chronic obstructive lung disease in horses, back problems and specific types of lameness in horses, anestrus in cattle, renal disease in dogs and cats, postoperative analgesia in animals, and effects on the immune system, respiratory tract function, and gastrointestinal motility. Suggested research in chiropractic included use of forceplate technology for lameness in horses and dogs, whereas suggested research in botanical medicine included effects on the immune system as well as use of botanicals in combination with chemotherapy for animals with neoplasia. It was suggested by many respondents that double-blind outcome trials be conducted.

The majority of respondents believed that the main reasons for limitations on the amount of research in CAVM were a lack of people trained in CAVM (13 ranked this as No. 1) or a lack of funding (14 ranked this as No. 1). Other pertinent reasons included lack of time or lack of interest. Skepticism, resistance, and criticism of colleagues in regard to research in CAVM also were concerns (14 respondents ranked these other concerns as No. 1). A number of respondents expressed concern regarding the need for appropriately designed, randomized, double-blind, well-controlled studies in each of the modalities of CAVM.

## Discussion

Veterinary and human medical schools throughout the world are developing educational and research programs in complementary and alternative medicine. On the basis of results of the survey reported here and my discussions with faculty members, it seems that a steady progressive incorporation of scientific methods is being used for the evaluation of CAVM.

The questionnaire used in the study reported here was an attempt to establish current and proposed plans

for educational and research programs in CAVM at the 27 US veterinary schools. This was a nonrandomly selected population and, thus, may be representative of only a small segment of the veterinary medical teaching community. Several respondents were from only a few institutions, which could have biased the results. It is certainly logical that a school with more faculty members trained or interested in CAVM would bring more attention to the topic, which could influence the development of courses in CAVM or the inclusion of those courses in the curriculum. Although I believe this did not affect the current situation for courses and research in CAVM at the various schools, I believe it was reflected in preferences for future plans.

Despite substantial resistance and skepticism from some faculty at various veterinary schools, many of the schools are beginning to acknowledge the massive interest and demand for CAVM by the public, students, veterinarians, and faculty, which is often expressed as a need for a constructive, evidence-based approach to incorporating CAVM into the veterinary curriculum. Several veterinary schools are developing programs to address this interest.

In addition to evaluating the training of veterinarians, training of veterinary technicians in several of these modalities should be considered. It is indicated in the 1996 AVMA Guidelines on Alternative and Complementary Veterinary Medicine that it is appropriate, in some states, for veterinary technicians trained in physical therapy to perform such treatments on animals. A few veterinary technician training programs have shown interest in expanding the role of veterinary technicians through this venue.

In human medicine, the American Medical Association has recognized the need for medical schools to respond to the growing interest in complementary and alternative medicine.<sup>3</sup> In a 1997 report,<sup>5</sup> the development of a model for an elective curriculum that would increase awareness of complementary and alternative medicine and its impact on human health care was studied. Furthermore, a recent study<sup>3</sup> revealed that 75 of 125 (64%) medical schools offered educational programs in complementary and alternative medicine. Currently, none of the medical schools have a required course in complementary and alternative medicine; however, 63 medical schools include these areas as part of a required course, and 54 medical schools offer a separate elective course.<sup>3</sup>

Because human medical schools, including such prestigious institutions as Harvard, Yale, Tufts, Columbia, Cornell, and Duke, are providing courses in complementary and alternative medicine, it seems reasonable that veterinary medical schools should begin to incorporate similar courses into the veterinary curriculum. Constructive suggestions on development of courses in complementary and alternative medicine in human medicine have been reported,<sup>3</sup> which could be extrapolated to courses at veterinary schools. In that article, it is suggested that introductory courses on complementary and alternative medicine should:

- Focus on critical thinking and review of the literature. An evidence-based approach should be

applied to the modalities, requiring accepted scientific rules of evidence on which to establish a sound basis for decision-making concerning the recommendation for any intervention.

- Identify thematic content. An introductory course should include acupuncture, chiropractic, botanical medicine, physical therapy, nutritional supplements, nutraceuticals, and homeopathy, as well as other modalities. History, philosophy, results of research, controversies, and clinical applications of each modality should be included.
- Provide an experiential component. Application of acupuncture or chiropractic or administration of botanical medicine adds a dimension to the learning process that lectures or controlled demonstrations cannot. A deeper understanding that results should provide a more substantial basis for providing advice to clients.<sup>6</sup>
- Teach students to talk to clients about CAVM. An introduction to clinical situations and the veterinarian-client-patient relationship should include opportunities to interact with clients about CAVM whether in clinical or role-play situations. Guidelines for these types of exercises should emphasize safety and shared decision making, such as exist for human medicine.<sup>6</sup>

On the basis of evaluation of responses to the questionnaire, complementary and alternative medicine programs in human medical schools, and CAVM education in veterinary medical schools, certain criteria for future development of courses must be met. Several challenges face those incorporating CAVM courses into a veterinary curriculum, including developing appropriate CAVM courses, creating time in the curriculum for those courses, providing a sufficient number of appropriately trained faculty, developing corresponding research programs in CAVM, and dealing with resistance from other faculty members.

The following proposals regarding curriculum changes involving CAVM were made on the basis of courses developed at various veterinary schools, including Colorado State University, Cornell University, University of Florida, and the University of Minnesota. These courses can be offered as an intensive course during a 2- to 5-day period or expanded to allow flexibility in scheduling by participants or to enable the course to be more comprehensive. The amount of time spent on each topic could vary on the basis of the interest at each particular veterinary school.

I recommend that course objectives for an introductory course in CAVM include providing a foundation to enable critical evaluation of the efficacy of CAVM modalities (veterinary acupuncture, botanical medicine, physical manipulative therapies, homeopathy, nutritional supplements, and nutraceuticals); providing a historical, philosophical, and scientific framework for each modality; defining each of the modalities and their indications, limitations, and potential adverse effects; providing the mechanism of action and scientific basis for each modality; creating means of integrating

use of CAVM into conventional-based veterinary practice; and describing the training required to acquire entry-level capabilities in each of the modalities in CAVM. Course outlines should include objectives of the course and a general introduction to historical and fundamental concepts of CAVM; a discussion of evidence-based medicine and critical evaluation of new and existing treatment; a review of the scientific basis, including published research, on the controversies, techniques, and clinical applications for use of the various modalities in companion, food animal, and exotic species; and discussion of modalities that may be included in other categories (eg, physical medicine may include modalities such as veterinary acupuncture, veterinary chiropractic, osteopathy, and physical therapy including electromagnetic and laser therapy as well as massage therapy). The integration of CAVM into clinical situations and discussions regarding reliable sources of information about CAVM also may be included.

The 2 prototype courses on CAVM (in general) and veterinary acupuncture that have been developed and currently are being used are those at Colorado State University and the University of Florida. Courses such as these have been offered as noncredit elective courses as well as for-credit (1 to 3 credit hours) elective courses.

Development of similar courses should require prerequisites, such as successful completion of the second year of the professional veterinary medical curriculum. Instruction should be provided by appropriately trained faculty members at the school, but it also could be provided by veterinarians who are not faculty members or by visiting or affiliate faculty. The format and instructional methods should comprise a combination of lectures, discussions, and demonstrations as well as supplementary readings in refereed scientific journals and text books.

Similarly, an introductory course on a specific modality, such as veterinary acupuncture, could be developed. Prerequisites, instructors, format, and course objectives would be similar to that for a general course in CAVM. The course outline should be as mentioned previously, including controversies and contraindications as well as integration into clinical practice.

In addition, various aspects of CAVM could be introduced during courses in the required curriculum. For example, anatomic and histologic characteristics of acupuncture points have been included in anatomy courses, the neurophysiologic basis of acupuncture has been included in physiology courses, and the pharmacologic characteristics of various herbal medicines have been included in pharmacology courses. I also believe that, in the future, the scientific basis for CAVM will be integrated and provided concurrently with those for conventional medicine and surgery.

Once courses have been designed, a challenge identified by the respondents involves finding sufficient time to teach CAVM in an extremely crowded curriculum. More schools are offering blocks of time when elective or selective courses are offered. One solution would be to also offer courses in CAVM during those blocks. In addition, as mentioned previously,

various aspects of CAVM may be briefly introduced during courses in the required curriculum, when appropriate.

Another challenge regarding training in CAVM is to have a sufficient number of appropriately trained faculty. This concern is being addressed by interested faculty members at several institutions, many of whom are undertaking advanced training in veterinary acupuncture and other areas of CAVM.

Postgraduate education in CAVM is currently accomplished through various certification programs in specific modalities, including veterinary acupuncture, veterinary chiropractic, Chinese herbal medicine, and homeopathy. These certification programs are provided by various organizations, not by accredited schools of veterinary medicine. Some of these certification programs are available to nonveterinarians. Within accredited US veterinary schools, only Colorado State University currently offers a postgraduate training program in veterinary acupuncture.

Should veterinary schools desire to develop postgraduate training programs in CAVM, they could use as their model the University of Arizona program in integrative medicine for humans. That program offers a fellowship position in complementary and alternative medicine.<sup>7</sup> Developers of the program believe that it is critical for their program and other similar programs to be based in academic teaching institutions. The core curriculum for the program comprises 12 subject areas,<sup>8</sup> which could be modified for a program in veterinary medicine. Development of a similar program at a school of veterinary medicine would require obtaining a source of funding and identifying a veterinary school that has appropriately trained faculty and supportive staff.

Another option for postgraduate training in CAVM would be the development of programs at an accredited school of veterinary medicine. This certification program could be developed as part of a degree-granting program (ie, Masters or Doctoral degree). The program could be in CAVM with specific degrees awarded in a specific modality. Additionally, such academic programs would stimulate research in specific modalities.

Postgraduate training via internship and residency programs in CAVM could be developed at veterinary schools, providing they have an adequate component of appropriately trained faculty. These could be specially designed programs that involve only CAVM or could be integrated into conventional clinical internship and residency programs with specific sections of time devoted to advanced training in CAVM.

Another challenge for veterinary schools is the development of research programs in CAVM. Many of the concerns regarding the lack of research in CAVM are addressed elsewhere.<sup>8</sup> Similar to the concern about a lack of veterinarians trained in CAVM to provide instruction to veterinary students, there is a concern about the lack of adequately trained researchers who also have training in CAVM. As mentioned previously, this is being addressed by an increased number of faculty undertaking training programs in CAVM.

Another concern regarding research programs in CAVM is the lack of available research funds. Although additional funding is being made available for CAVM

research projects, lack of funding is still a substantial hindrance preventing an adequate amount of research in CAVM. As the commercial interest continues to develop in CAVM products, such as nutraceuticals and botanical medicines, manufacturing companies may provide a source of research support. The National Institutes of Health have increased their research budget for complementary and alternative medicine from 20 million to 50 million dollars. Some of those funds may be available for veterinary researchers.

A final challenge faced by those interested in CAVM is the substantial skepticism voiced by a number of faculty. One of the major concerns of these skeptics is the lack of research conducted in CAVM. In my opinion, the only way to address this concern is to acknowledge there is a paucity of high-quality research on CAVM and to encourage investigators at veterinary schools to conduct research on CAVM. Lack of financial and academic support for research in CAVM must be overcome. Lack of evidence of efficacy does not necessarily imply that there is a lack of efficacy; rather, it could indicate that there has been insufficient research to provide scientific evidence of efficacy. Skeptics of CAVM will not be convinced without proof provided by conscientious research.

In my opinion, it is important for veterinarians to be knowledgeable about botanical medicine, herbs and their active ingredients, contraindications for their use, and drug interactions, because clients may administer these products to their animals, and those compounds may interact with prescribed medications. In addition, I believe that if we do not integrate CAVM into the broad scope of veterinary medicine, the public will seek nonveterinarians to provide such treatments. Owners may pursue CAVM administered by people who are not appropriately trained in veterinary medicine or the use of CAVM in animals. Choosing to ignore various modalities within CAVM, or electing to not integrate them into a professional approach in veterinary medicine, will not make them disappear. Instead, it will allow self-proclaimed healers, including many nonveterinarians who may have only completed a 2-day training program, to use these modalities on animals, which is not in the best interest of the animals. I believe it is in the best interest of our profession for veterinarians to develop a proactive, open-minded, professional approach to integrating CAVM into veterinary medicine.

In retrospect, these survey results regarding future interests in CAVM would have been more comprehensive if I had received input from all of the veterinary schools. However, I do not believe the current status of CAVM education and research was biased by these results. It was my personal assumption that lack of response from personnel at the 4 nonresponding veterinary schools, despite numerous attempts to gather information, was an indication of lack of programs or lack of interest. Obviously, on the basis of the additional information obtained about personnel at 1 of those nonresponding schools, this assumption was in error. Thus, it is probable that other people at US veterinary schools may be contemplating developing courses or conducting research in CAVM.

It appears that interest in CAVM by the public and veterinarians will only continue to increase. Therefore, it is prudent for veterinary schools to consider developing introductory and advanced (postgraduate) educational and training programs in CAVM. Similar to the situation for human physicians,<sup>9</sup> clients increasingly seek to identify veterinarians who are trained and experienced in conventional veterinary medicine but who also are open-minded and knowledgeable about the value and limitations of CAVM. Institutional support is necessary to create and maintain viable and sustainable academic programs. Similar to human medicine,<sup>1</sup> discussions about the best way to prepare veterinarians for this role has only just begun. As with most newly defined challenges, there is a need for interdisciplinary discussion and development of an appropriately planned approach. As medical professionals, veterinarians increasingly will be expected to advise clients who request information about CAVM. In my opinion, development of an appropriate curriculum and research programs in CAVM at schools of veterinary medicine is essential to address the increasing demand.

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<sup>9</sup>Chadderdon L. Dr. Debbie Wilson asks: Is acupuncture effective? In: Chadderdon L, ed. *Inside CVM*. Vol XXV. East Lansing, Mich: College of Veterinary Medicine, Michigan State University; 2000.

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