

# Developing and Implementing Core Competencies for Integrative Medicine Fellowships

Melinda Ring, MD, Marc Brodsky, MD, Tieraona Low Dog, MD, Victor Sierpina, MD, Michelle Bailey, MD, Amy Locke, MD, Mikhail Kogan, MD, James A. Rindfleisch, MPhil, MD, and Robert Saper, MD, MPH

## Abstract

The Consortium of Academic Health Centers for Integrative Medicine defines integrative medicine as “the practice of medicine that reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic approaches, health care professionals, and disciplines to achieve optimal health and healing.” Over the past three decades, the U.S. public increasingly has sought integrative medicine approaches. In an effort to train medical professionals to adequately counsel patients on the safe and appropriate use of these

approaches, medical schools and residencies have developed curricula on integrative medicine for their trainees. In addition, integrative medicine clinical fellowships for postresidency physicians have emerged to provide training for practitioners interested in gaining greater expertise in this emerging field. Currently, 13 clinical fellowships in integrative medicine exist in the United States, and they are predominantly connected to academic medical centers or teaching affiliate hospitals. In 2010, the Consortium of Academic Health Centers for Integrative Medicine, represented by 56 member

academic health care institutions with a shared commitment to advance the principles and practices of integrative medicine, convened a two-year task force to draft integrative medicine fellowship core competencies. These competencies would guide fellowship curriculum development and ensure that graduates possessed a common body of knowledge, skills, and attitudes. In this article, the authors discuss the competencies and the task force’s process to develop them, as well as associated teaching and assessment methods, faculty development, potential barriers, and future directions.

**T**he Consortium of Academic Health Centers for Integrative Medicine (CAHCIM) defines integrative medicine as “the practice of medicine that reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic approaches, health care professionals, and disciplines to achieve optimal health and healing.”<sup>1</sup> In 1993, Eisenberg and colleagues<sup>2</sup> first reported on the widespread, public use of complementary and alternative medicine (CAM) approaches not generally taught in medical school or practiced in U.S. hospitals.<sup>3</sup> Since then, health care providers increasingly have embraced these approaches in their practice of

medicine.<sup>4</sup> The research, teaching, and clinical aspects of integrative medicine have developed to meet the public demand for this new comprehensive, interdisciplinary approach to health care.

The public’s growing interest in integrative medicine has stimulated an increase in research and knowledge on the field. Notably, in 1998, the National Institutes of Health (NIH) established the National Center for Complementary and Alternative Medicine (NCCAM) to explore complementary and alternative healing practices in the context of rigorous science, train CAM researchers, and disseminate authoritative information to the public and professionals. In 2012, the annual budget of NCCAM reached \$128 million.<sup>5</sup>

In addition to NCCAM, other NIH institutes and federal agencies also support the systematic evaluation of the scientific foundations of CAM approaches as well as the safety and efficacy of their application to patient care. For instance, in fiscal year 2010, the National Cancer Institute invested \$123 million in CAM investigations, including intramural projects and

extramural grants; cooperative agreements and contracts; research grants; training grants; and R25 cancer education grants.<sup>6</sup>

Likewise, academic institutions have responded to the public demand and to the field’s growing evidence base with a variety of integrative medicine curricula and training initiatives. By 1998, 64% of U.S. medical schools offered some form of CAM or integrative medicine curriculum.<sup>7</sup> In 2004, Kligler and colleagues<sup>8</sup> published a set of core competencies related to integrative medicine education for medical students. The authors noted a steady rise in integrative medicine-related courses in medical schools accredited by the Liaison Committee on Medical Education (LCME). Annual surveys and reports by the Association of American Colleges confirm the rising inclusion of CAM curriculum.<sup>9</sup>

For residency training, the Society of Teachers of Family Medicine Group on Integrative Medicine outlined a minimum set of integrative medicine competencies based on the six Accreditation Council for Graduate

Please see the end of this article for information about the authors.

Correspondence should be addressed to Dr. Ring, Northwestern Integrative Medicine, 150 E. Huron Ave., Suite 1100, Chicago, IL 60611; telephone: (312) 926-3627; e-mail: mring@nmh.org.

Acad Med. 2014;89:00–00.

First published online

doi: 10.1097/ACM.0000000000000148

Supplemental digital content for this article is available at <http://links.lww.com/ACADMED/A181>.

Medical Education (ACGME) core competencies<sup>10</sup>—medical knowledge, patient care, professionalism, systems-based practice, practice-based learning and improvement, and interpersonal skills and communication—which address the specific knowledge, skills, and attitudes as well as the appropriate educational experiences required of residents to complete graduate medical education in the United States. In addition, the University of Arizona started the Integrative Medicine in Residency (IMR) program, a 200-hour core curriculum, based on the ACGME competencies, that includes both online and on-site learning activities. Thirty family medicine and two internal medicine residencies in the United States have adopted the IMR curriculum.<sup>11</sup> In 2012, the U.S. Department of Health and Human Services Health Resources and Services Administration funded \$2.5 million for integrative medicine training in preventive medicine residencies.<sup>12</sup> This funding was authorized by the

Public Health Service Act and the Patient Protection and Affordable Care Act.<sup>12</sup>

Over the past two decades, integrative medicine clinical fellowships for postresidency physicians have emerged concurrently with integrative medicine residency programs. The University of Arizona offered the first integrative medicine fellowship in 1996. Since then, over 1,000 medical professionals have completed the program, with graduates practicing in 47 states as well as in 15 countries abroad.<sup>13,14</sup> Another development is the integrative family medicine program—six residencies added an additional year of fellowship-level training to the standard three-year family medicine residency curriculum.<sup>15</sup> In total, 13 clinical fellowships in integrative medicine now exist in the United States, and they are predominantly being established as part of academic medical centers or teaching affiliate hospitals (see Table 1).

However, the lack of uniform training and credentialing for physicians specializing in integrative medicine has limited the field's recognition within academic institutions and hospital settings. Since 1996, the American Board of Integrative Holistic Medicine has certified over 1,000 physicians, but this certification process lacks rigorous competencies, and eligible candidates are not required to have completed an integrative medicine fellowship program.<sup>16</sup> An effort to create a certification process with greater oversight and more stringent eligibility requirements led, in 2012, to the establishment of the American Board of Integrative Medicine (ABOIM) under the auspices of the American Board of Physician Specialties.<sup>17</sup> In 2014, the first exams for ABOIM certification will be held. Eventually, to qualify for ABOIM certification, a physician will have to complete an integrative medicine fellowship. However, until 2016, physicians with

**Table 1**  
**Characteristics of the 13 Existing Integrative Medicine Clinical Fellowships as of September 2011\***

| Institution (year established)               | Duration in years | Eligible fields              | Inpatient consults | Outpatient: PC <sup>†</sup> or C | Research: R or O | CAM providers on care team <sup>‡</sup> |
|--|-------------------|------------------------------|--------------------|----------------------------------|------------------|---|
| University of Arizona (1996)                 | 2 <sup>§</sup>    | PC, subspecialties           | No                 | N/A                              | O                | N/A                                     |
| UCLA (1999)                                  | 2                 | PC, subspecialties           | O                  | C                                | O                | Yes                                     |
| Beth Israel Medical Center (2001)            | 1                 | Family medicine              | No                 | PC + C                           | O                | Yes                                     |
| Bravewell Fellowship Program (2003)          | 2                 | PC, subspecialties           | O                  | PC + C                           | O                | Yes                                     |
| University of Wisconsin (2003)               | 2                 | Family medicine              | No                 | PC + C                           | O                | Yes                                     |
| Maine Medical Center (2003)                  | 1                 | Family medicine              | Yes                | PC + C                           | O                | External referrals                      |
| University of Michigan (2004)                | 1                 | Family medicine              | Yes                | PC + C                           | O                | External referrals                      |
| Greater Lawrence Family Health Center (2005) | 1                 | Family medicine              | O                  | PC + C                           | O                | Yes                                     |
| Middlesex Hospital (2005)                    | 2                 | Family medicine              | No                 | PC + C                           | O                | External referrals                      |
| University of Kansas (2007)                  | 1                 | PC                           | Yes                | PC + C                           | R                | Yes                                     |
| Ohio State University (2008)                 | 1                 | PC, subspecialties           | No                 | PC                               | R                | Yes                                     |
| Santa Rosa (2008)                            | 1                 | Family medicine              | No                 | PC + C                           | O                | External referrals                      |
| Stamford Hospital (2011)                     | 2                 | Family and internal medicine | No                 | C                                | R                | External referrals                      |

\*PC indicates primary care; C, consults; R, required; O, optional; CAM, complementary and alternative medicine; and N/A, not applicable.

<sup>†</sup>Primary care includes internal medicine, family medicine, and pediatrics.

<sup>‡</sup>These are care teams in which CAM providers share in the interdisciplinary care of patients. The most commonly cited disciplines include acupuncturists/traditional Chinese medicine, licensed massage therapists, and health psychologists/mental health providers. Other examples include naturopathic doctors, chiropractic doctors, Healing Touch or Reiki providers, movement instructors (e.g., yoga, tai chi), mindfulness meditation instructors, and Ayurveda practitioners.

<sup>§</sup>The University of Arizona program is primarily online distance learning with several on-site periods.

the necessary training and relevant experience in integrative medicine will be grandfathered in and will be able to sit for the exam.<sup>17</sup>

Regardless of the certifying organization, the first step to assuring the quality of integrative medicine physicians' skills and knowledge is collective agreement on the necessary competencies, followed by the development of a corresponding curriculum. Integrative medicine fellowship training standards would ensure that those who promote themselves as integrative medicine "specialists" have met a broadly agreed-on set of training requirements. At the same time, the competencies need to be flexible enough to allow each program to use institution-specific expertise and resources to optimize training opportunities.

In 2010, the CAHCIM, represented by 56 member academic health care institutions with a shared commitment to advance the principles and practices of integrative medicine, convened a two-year task force to draft integrative medicine fellowship core competencies. In this article, we discuss the competencies and the task force's process to develop them, as well as associated teaching and assessment methods, faculty development, potential barriers, and future directions.

## **Integrative Medicine Fellowship Core Competencies**

### **Development of the competencies**

The CAHCIM's integrative medicine fellowship core competencies task force undertook the charge of identifying the essential competencies for graduates of integrative medicine fellowships. These competencies were intended to help establish standards for existing integrative medicine fellowships and to provide guidance for future fellowships. The task force included nine physician members of the CAHCIM, chosen for their expertise as integrative medicine educators and their diversity in specialty training (family medicine, internal medicine, pediatrics, geriatrics, palliative care). All coauthors on this article were members of the task force.

The task force members determined a work plan that included a review of the objectives and curricula of

the 13 existing integrative medicine clinical fellowships. From January to March 2011, they created a template of questions regarding the program design, curriculum, financial information, educational methods, and required competencies to learn more about the existing fellowships. They contacted all fellowship directors by telephone and e-mail to gather their responses to the questions and for further discussion. Over the subsequent months (April to September 2011), the group systematically collated existing integrative medicine fellowship competencies. Through regular conference calls, task force members used this information, the existing scientific literature, and their own expertise to draft an initial set of competencies, using the ACGME core competencies as the foundation. From October 2011 to April 2012, task force members and other CAHCIM members revised the competencies iteratively through several in-person meetings, monthly conference calls, and e-mail. Workshops at the 2012 International Research Congress on Integrative Medicine and Health in Portland, Oregon (M.R., M.B., R.S.), and at the 2012 International Congress for Educators in Complementary and Integrative Medicine in Washington, DC (M.R., M.B., T.L., V.S.), provided opportunities for public commentary and discussion on the drafted competencies. From November to December 2012, the task force members also solicited constructive feedback from the directors of the existing integrative medicine fellowships.

### **About the competencies**

With the exception of the medical knowledge and patient care competencies, the other integrative medicine competencies align with the corresponding ACGME competencies, which are to a larger degree shared by all medical specialties and subspecialties, and they required only minor additions or modifications specific to integrative medicine (for the task force's final report, see Supplemental Digital Appendix 1 at <http://links.lww.com/ACADMED/A181>).

The task force determined that the expectations of fellows in the areas of medical knowledge and patient care are the most distinctive for integrative

medicine trainees relative to other specialties. These competencies (see Appendix 1) describe how integrative medicine fellows, on completion of their training, should be able to incorporate the expanding fund of knowledge in integrative medicine into patient care that is safe, effective, patient-centered, timely, evidence-based, efficient, and equitable.<sup>18</sup> Four notable areas from the integrative medicine competencies include:

**Pain management.** In the 2011 report "Relieving Pain in America," the Institute of Medicine emphasized the application of knowledge, skills, and attitudes to improve quality of life in patients with pain conditions.<sup>19</sup> Over the past decade, research has supported the efficacy of CAM approaches, including tai chi,<sup>20</sup> acupuncture,<sup>21</sup> massage,<sup>22</sup> and yoga,<sup>23</sup> for relieving chronic pain of diverse origins. To relieve suffering in patients with pain, an integrative medicine fellow should be able to develop an individualized treatment approach that includes both pharmacological therapies and integrative methods.

**Nutritional science.** Almost 20% of the U.S. population report the use of poorly regulated dietary supplements and diet-based therapies, often because of information from biased or unscientific sources.<sup>3</sup> Thus, a thorough understanding of the evidence for the risks and benefits of nutritional and supplement approaches to health and illness is critical. Fellows should be able to both help patients navigate the conflicting claims and counsel them on the approaches they should consider (e.g., the Mediterranean diet)<sup>24,25</sup> and those they should avoid because of a lack of efficacy (e.g., saw palmetto for benign prostatic hypertrophy)<sup>26</sup> or safety (e.g., ephedra for weight loss).<sup>27</sup>

**Mind–body medicine.** The impact of stress on health is now broadly accepted.<sup>28</sup> Examples of mind–body practices with demonstrated effectiveness include mindfulness-based stress reduction for anxiety<sup>29</sup> and guided imagery for invasive procedures.<sup>30</sup> Integrative medicine fellows should know how to implement mind–body approaches for health promotion and treatment of illness.

**Lifestyle medicine.** Integrative medicine fellows should have in-depth scientific

knowledge of the relationships of lifestyle behaviors, such as diet, physical activity, and sleep, with health and chronic diseases, such as diabetes,<sup>31</sup> osteoarthritis,<sup>32</sup> and depression.<sup>33</sup> They also should master the skills needed to motivate patients to successfully change their behaviors to incorporate evidence-based, lifestyle-related, self-care interventions.

Additional integrative medicine competencies include knowledge of the characteristics of commonly used, evidence-based CAM practices, the demographic and epidemiologic patterns of CAM and integrative medicine use, and the relevant legal and ethical issues.

### **Strategies for Teaching Integrative Medicine in Fellowships**

Teaching integrative medicine at the fellowship level may follow multiple formats and must allow for a high degree of flexibility for programs to focus on institution-specific areas of specialization. For example, in our survey of existing integrative medicine fellowships, we learned that curricula used supervised clinical practice, integrative medicine rotations, didactic sessions, assigned readings, Web-based modules, and conferences.

In addition, many included a mentorship component to ensure that fellows learn to effectively incorporate knowledge, skills, and attitudes into safe, evidence-based, interdisciplinary care for optimal patient outcomes. Existing fellowships offered diverse clinical experiences, including inpatient care as well as outpatient consultation and/or primary care practices.

As experiential learning is ideal in some areas,<sup>8</sup> fellows may participate in or observe a variety of CAM modalities firsthand. Interdisciplinary networking with CAM practitioners from diverse training backgrounds who are appropriately vetted for proper credentials and safe practices may facilitate the delivery of this sort of experiential learning.

### **Methods to Assess Competence in Fellows and Graduates**

After the introduction of these competencies, essential next steps include developing methods to evaluate fellows' attainment of the competencies, guidelines for certification in integrative medicine, and continuing medical education (CME) requirements for graduates. Assessment techniques to evaluate a fellow's attainment of the competencies may include direct observation by faculty; testing for mastery of knowledge; completion of education, research, or other scholarly projects; quality of teaching as assessed by learners; and patient care metrics, such as patient satisfaction and health outcomes. For certification in integrative medicine, fellows who seek training in a specific CAM modality should meet licensing requirements according to state regulatory boards, if applicable.

As with all specialty areas, the evolving knowledge base in integrative medicine necessitates that physicians stay current with new and emerging evidence that affects patient care. The American Board of Medical Specialties Maintenance of Certification provides a helpful framework. The 24 member boards are now implementing maintenance of certification programs that aim to foster physicians' commitment to lifelong learning and competency in their specialty and/or subspecialty area by requiring the ongoing measurement of the six core competencies adopted by the ABMS and ACGME.<sup>34</sup>

### **Approaches to Faculty Development**

The success of integrative medicine fellowships will depend in large part on the quality of the leaders and faculty. Thus, program directors need to continually identify a sufficient number of qualified faculty members for both educational and clinical mentorship responsibilities. As these faculty members serve as role models, they ideally should perform competently in their specialty area, hold appropriate institutional appointments, and remain up-to-date on their medical licensure and/or

the appropriate qualification in their particular areas of teaching.

Integrative medicine fellowship faculty, like faculty in all ACGME-approved fellowships, should be familiar with the ACGME's general policies and procedures for graduate medical education.<sup>35</sup> Thus, core requirements for integrative medicine educators include effective interdisciplinary communication skills, maintenance of competence in their area of teaching, and adequate time to devote to the educational program. The pool of potential faculty with these attributes will continue to grow as physicians increasingly participate in integrative medicine fellowships and other training opportunities.

The recent ACGME guidelines for faculty teaching in residency and fellowship programs call for program leaders and core faculty to participate annually in leadership or faculty development programs relevant to their roles in the training program.<sup>36</sup> By doing so, faculty members may enhance the effectiveness of their skills as educators or other positions they hold in the program. Integrative medicine fellowships should incorporate these guidelines as well as a formal requirement that faculty pursue CME credit to remain current in their emerging fields. Both these requirements will help to improve the quality of teaching by faculty members.

### **Potential Barriers to Implementing the Competencies**

A number of potential barriers may challenge the introduction of these competencies into existing and future integrative medicine fellowships. The current lack of ABMS and ACGME accreditation status for the field means that Medicare funding cannot be used for graduate medical education in integrative medicine, notably faculty members' salaries and their protected time for teaching. Thus, each institution must establish a unique revenue stream to subsidize the fellowship, which may prove challenging.

Negotiating the contrasting paradigms between some CAM modalities and the biomedical model may provide

additional barriers to introducing competencies into integrative medicine fellowships. For example, *Qi*, the life energy or life force concept central to traditional Chinese medicine, is difficult to explain using existing biomedical research techniques and technologies. Using a “best-evidence” approach in CAM modalities may help to avoid such ideological quagmires while optimizing patient care. In addition, by examining the effects of CAM treatments using quantifiable physiologic measures and standardized tools, the growing body of knowledge in integrative medicine continues to provide common ground between different traditions of medicine.

Next, establishing close working relationships between integrative medicine fellows and CAM practitioners may present unique challenges. One of the medical knowledge competencies states that fellows should have a good understanding of the training, licensing, credentialing, and scope of practice of CAM providers. Fellows should be able to collaborate with appropriately credentialed CAM practitioners as part of the process of establishing effective working relationships and interdisciplinary integrative medicine teams. For example, massage therapists, acupuncturists, and art and music therapists now participate together in hospice programs across the country.<sup>37</sup>

Finally, we recognize that many mid- to late-career integrative medicine physicians have not participated in a formal fellowship but instead have acquired expertise through years of independent training and practice. As with other emerging medical specialties, the “grandfathering” pathway offered by the ABoIM will allow these physicians to be recognized properly for their proficiency.

### Future Directions

For integrative medicine approaches to become widely recognized best practices in medicine, the field needs pragmatic clinical research that assesses patient-centered outcomes. The Patient-Centered Outcomes Research Institute (PCORI), authorized by the Patient Protection and Affordable Care Act, is a newly

established, independent, nonprofit health research organization that could play an important role in this process. In May 2012, PCORI established its National Priorities and Research Agenda, which outlined five national priorities for research. One of the priorities was “Improving Healthcare Systems,” which explicitly states the need for comparative effectiveness studies on integrative health practices.<sup>38</sup>

Given the historic trend toward increased use of CAM modalities in the United States, we predict that patient demand for physicians well versed in this field will continue to grow. Physicians trained in integrative medicine, who have close working relationships with highly trained CAM providers, will be ideally positioned to help guide patients through a variety of decision-making paths involving integrative medicine approaches. Chronic pain, stress-mediated conditions, and other multifactorial symptoms that limit a patient’s ability to function are important patient care domains to which integrative medicine will continue to add value. In addition, the medical literature has raised concerns about the lack of professional guidance on using natural products, including herbs, vitamins, and other dietary supplements.<sup>39,40</sup> For example, an estimated 1 in 25 elders are at risk for a harmful natural product–drug interaction.<sup>41</sup> Physicians trained in integrative medicine will be able to effectively counsel patients, policy makers, and regulatory authorities about the appropriate use or avoidance of natural products.

### In Conclusion

Patient-centered care, the focal point of our evolving health care system, includes respect for and knowledge of how medical pluralism, cultural diversity, spiritual beliefs, and interdisciplinary teamwork play a significant role in patients’ health and healing. Many professional medical organizations promote these principles, but in practice they can be difficult to implement. Physicians trained in integrative medicine will be well positioned to assume leadership roles as educators and policy advocates in a health care system committed to providing patient-centered care.

Increasingly, academic health centers are establishing integrative medicine fellowships. However, for integrative medicine to be accepted as other medical specialties are, it must demonstrate an equal commitment to ensuring that graduates of these training programs achieve proficiency across a uniform set of competencies. Integrative medicine physicians then will be in a position to add value to the evolving health care environment and its increasing emphasis on patient-centered care and interdisciplinary teams.

*Acknowledgments:* The authors acknowledge Marina Kaasovic, Consortium associate in the Consortium of Academic Health Centers for Integrative Medicine, for her technical assistance.

*Funding/Support:* None reported.

*Other disclosures:* None reported.

*Ethical approval:* Reported as not applicable.

*Previous presentations:* The authors presented a draft of the core competencies for discussion and feedback in workshops at the 2012 International Research Congress on Integrative Medicine and Health in Portland, Oregon, and at the 2012 International Congress for Educators in Complementary and Integrative Medicine in Washington, DC.

---

**Dr. Ring** is assistant professor of clinical medicine, Department of Medicine, Northwestern University Feinberg School of Medicine, Chicago, Illinois.

---

**Dr. Brodsky** is assistant clinical professor of medicine, Department of Medicine, Columbia University College of Physicians and Surgeons, New York, New York.

---

**Dr. Low Dog** is clinical associate professor of medicine, Department of Medicine, University of Arizona Health Sciences Center, Tucson, Arizona.

---

**Dr. Sierpina** is professor of family medicine, Department of Family Medicine, University of Texas Medical Branch, Galveston, Texas.

---

**Dr. Bailey** is instructor, Department of Pediatrics, Duke University School of Medicine, Durham, North Carolina.

---

**Dr. Locke** is assistant professor of family medicine, Department of Family Medicine, University of Michigan Medical School, Ann Arbor, Michigan.

---

**Dr. Kogan** is assistant professor of medicine, Division of Geriatrics and Palliative Medicine, George Washington University School of Medicine and Health Sciences, Washington, DC.

---

**Dr. Rindfleisch** is associate professor, Department of Family Medicine, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin.

---

**Dr. Saper** is associate professor of family medicine, Department of Family Medicine, Boston University School of Medicine, Boston, Massachusetts.

## References

- 1 Consortium of Academic Health Centers for Integrative Medicine. About Us. Developed and Adopted by the Consortium May 2004. Updated November 2009. <http://www.imconsortium.org/about/home.html>. Accessed November 13, 2013.
- 2 Eisenberg DM, Kessler RC, Foster C, Norlock FE, Calkins DR, Delbanco TL. Unconventional medicine in the United States: Prevalence, costs, and patterns of use. *N Engl J Med*. 1993;328:246–252.
- 3 Barnes PM, Bloom B, Nahin RL. Complementary and alternative medicine use among adults and children: United States, 2007. *Natl Health Stat Report*. December 10, 2008;1–23.
- 4 Horrigan B, Lewis S, Abrams D, Pechura C. Integrative Medicine in America: How Integrative Medicine Is Being Practiced in Clinical Centers Across the United States. Minneapolis, Minn: The Bravewell Collaborative; 2012.
- 5 National Center for Complementary and Alternative Medicine. NCCAM Funding: Appropriations History. <http://nccam.nih.gov/about/budget/appropriations.htm>. Accessed November 13, 2013.
- 6 National Cancer Institute, Office of Cancer Complementary and Alternative Medicine. Annual report on complementary and alternative medicine. FY 2011. Bethesda, Md: National Institutes of Health; 2013.
- 7 Wetzel MS, Eisenberg DM, Kaptchuk TJ. Courses involving complementary and alternative medicine at US medical schools. *JAMA*. 1998;280:784–787.
- 8 Kligler B, Maizes V, Schachter S, et al; Education Working Group, Consortium of Academic Health Centers for Integrative Medicine. Core competencies in integrative medicine for medical school curricula: A proposal. *Acad Med*. 2004;79:521–531.
- 9 Annual Liaison Committee on Medical Education Medical School Questionnaires. 2012. <https://www.aamc.org/newsroom/reporter/feb2012/273812/therapies.html>. Accessed December 31, 2013.
- 10 Society of Teachers of Family Medicine Group on Integrative Medicine. Recommended IM competencies for family medicine residents. Cited September 25, 2012. <http://fmdrl.org/index.cfm?event=c.be ginBrowseD&clearSelections=1&currentGroups=370#3650>. Accessed November 13, 2013.
- 11 Lebensohn P, Kligler B, Dodds S, et al. Integrative medicine in residency education: Developing competency through online curriculum training. *J Grad Med Educ*. 2012;4:76–82.
- 12 Health Resources and Services Administration. Preventive Medicine and Public Health Training Grant Program. HRSA-13-174. Cited November 23, 2012. <http://www.grants.gov/web/grants/view-opportunity.html?oppId=201393>. Accessed November 13, 2013.
- 13 Maizes V, Schneider C, Bell I, Weil A. Integrative medical education: Development and implementation of a comprehensive curriculum at the University of Arizona. *Acad Med*. 2002;77:851–860.
- 14 Arizona Center for Integrative Medicine. Integrative Medicine Fellowship. <http://integrativemedicine.arizona.edu/education/fellowship/index.html>. Accessed November 13, 2013.
- 15 Maizes V, Silverman H, Lebensohn P, et al. The integrative family medicine program: An innovation in residency education. *Acad Med*. 2006;81:583–589.
- 16 Sierpina V, Kreitzer MJ, Anderson R, Hanaway P, Shannon S, Sudak N. The American Board of Integrative and Holistic Medicine: Past, present, and future. *Explore (NY)*. 2010;6:192–195.
- 17 American Board of Physician Specialties. American Board of Integrative Medicine. Board Certification. <http://www.abpsus.org/integrative-medicine>. Accessed November 13, 2013.
- 18 Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC: National Academies Press; 2001.
- 19 Institute of Medicine. Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research. Washington, DC: National Academies Press; 2011.
- 20 Hall A, Maher C, Latimer J, Ferreira M. The effectiveness of Tai Chi for chronic musculoskeletal pain conditions: A systematic review and meta-analysis. *Arthritis Rheum*. 2009;61:717–724.
- 21 Manheimer E, Cheng K, Linde K, et al. Acupuncture for peripheral joint osteoarthritis. *Cochrane Database Syst Rev*. 2010;(1):CD001977.
- 22 Furlan AD, Imamura M, Dryden T, Irvin E. Massage for low-back pain. *Cochrane Database Syst Rev*. 2008;(4):CD001929.
- 23 Cramer H, Lauche R, Haller H, Dobos G. A systematic review and meta-analysis of yoga for low back pain. *Clin J Pain*. 2013; 29:450–460.
- 24 Pérez-López FR, Chedraui P, Haya J, Cuadros JL. Effects of the Mediterranean diet on longevity and age-related morbid conditions. *Maturitas*. 2009;64:67–79.
- 25 Serra-Majem L, Roman B, Estruch R. Scientific evidence of interventions using the Mediterranean diet: A systematic review. *Nutr Rev*. 2006;64:S27–S47.
- 26 Barry MJ, Meleth S, Lee JY, et al; Complementary and Alternative Medicine for Urological Symptoms (CAMUS) Study Group. Effect of increasing doses of saw palmetto extract on lower urinary tract symptoms: A randomized trial. *JAMA*. 2011;306:1344–1351.
- 27 Shekelle PG, Hardy ML, Morton SC, et al. Efficacy and safety of ephedra and ephedrine for weight loss and athletic performance: A meta-analysis. *JAMA*. 2003;289:1537–1545.
- 28 Vitetta L, Anton B, Cortizo F, Sali A. Mind–body medicine: Stress and its impact on overall health and longevity. *Ann N Y Acad Sci*. 2005;1057:492–505.
- 29 Fjorback LO, Arendt M, Ornbøl E, Fink P, Walach H. Mindfulness-based stress reduction and mindfulness-based cognitive therapy: A systematic review of randomized controlled trials. *Acta Psychiatr Scand*. 2011;124:102–119.
- 30 Lang EV, Benotsch EG, Fick LJ, et al. Adjunctive non-pharmacological analgesia for invasive medical procedures: A randomised trial. *Lancet*. 2000;355: 1486–1490.
- 31 Lindström J, Ilanne-Parikka P, Peltonen M, et al; Finnish Diabetes Prevention Study Group. Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: Follow-up of the Finnish Diabetes Prevention Study. *Lancet*. 2006;368:1673–1679.
- 32 Vincent HK, Heywood K, Connelly J, Hurley RW. Obesity and weight loss in the treatment and prevention of osteoarthritis. *PM R*. 2012;4(5 suppl):S59–S67.
- 33 Herring MP, Puetz TW, O'Connor PJ, Dishman RK. Effect of exercise training on depressive symptoms among patients with a chronic illness: A systematic review and meta-analysis of randomized controlled trials. *Arch Intern Med*. 2012;172:101–111.
- 34 American Board of Medical Specialties. ABMS Maintenance of Certification. Cited November 7, 2012. [http://www.abms.org/maintenance\\_of\\_certification/ABMS\\_MOC.aspx](http://www.abms.org/maintenance_of_certification/ABMS_MOC.aspx). Accessed November 13, 2013.
- 35 Accreditation Council for Graduate Medical Education. Policies and Procedures. Approved September 2012. [http://acgme.org/acgmeweb/Portals/0/PDFs/ab\\_ACGMEPoliciesProcedures.pdf](http://acgme.org/acgmeweb/Portals/0/PDFs/ab_ACGMEPoliciesProcedures.pdf). Accessed November 13, 2013.
- 36 Accreditation Council for Graduate Medical Education. Common Program Requirements. Program Evaluation and Improvement. [http://acgme.org/acgmeweb/Portals/0/PDFs/commonguide/VC\\_Evaluation\\_ProgramEvaluation\\_Explanation.pdf](http://acgme.org/acgmeweb/Portals/0/PDFs/commonguide/VC_Evaluation_ProgramEvaluation_Explanation.pdf). Accessed December 3, 2013.
- 37 Corbin LW, Mellis BK, Beaty BL, Kutner JS. The use of complementary and alternative medicine therapies by patients with advanced cancer and pain in a hospice setting: A multicentered, descriptive study. *J Palliat Med*. 2009;12:7–8.
- 38 Patient-Centered Outcomes Research Institute. National Priorities and Research Agenda. <http://www.pcori.org/research-we-support/priorities-agenda/>. Accessed November 13, 2013.
- 39 Ventola CL. Current issues regarding complementary and alternative medicine (CAM) in the United States: Part 2: Regulatory and safety concerns and proposed governmental policy changes with respect to dietary supplements. *P T*. 2010;35:514–522.
- 40 Cassileth BR, Heitzer M, Wesa K. The public health impact of herbs and nutritional supplements. *Pharm Biol*. 2009;47:761–767.
- 41 Qato DM, Alexander GC, Conti RM, Johnson M, Schumm P, Lindau ST. Use of prescription and over-the-counter medications and dietary supplements among older adults in the United States. *JAMA*. 2008;300:2867–2878.

## Appendix 1

### **Patient Care and Medical Knowledge Integrative Medicine Fellowship Core Competencies, Consortium of Academic Health Centers for Integrative Medicine, 2012**

#### **1. Patient Care**

*The integrative medicine fellow should demonstrate compassionate, appropriate, and effective patient care based on the existing evidence base in integrative medicine for disease prevention, treatment of illness, and health promotion.*

- 1.1. Perform an in-depth integrative medicine assessment.
  - 1.1.1. Demonstrate advanced skill in collecting essential components of an integrative medicine assessment, including but not limited to:
    - Identifying patients' health concerns, goals, and expectations.
    - A thorough conventional medical history and physical exam.
    - Current and past complementary and alternative medicine (CAM) therapy use, including patient experience and response.
    - Current and past dietary supplement intake.
    - Nutrition, physical activity, sleep pattern.
    - Stressors and stress management skills.
    - Personal relationships, social network, support systems.
    - Religious and spiritual history.
  - 1.1.2. Develop an appropriate differential diagnosis and perform a diagnostic evaluation based on available guidelines and evidence for conventional and integrative testing.
- 1.2. Demonstrate advanced skills in developing integrative medicine treatment plans based on patient values and preferences, up-to-date scientific evidence, and clinical judgment. Treatment plans should:
  - 1.2.1. Integrate conventional medicine, evidence-based complementary therapies, and lifestyle modification, as appropriate.
  - 1.2.2. Address patient concerns in one or more domains (e.g., physical, psychological, social, spiritual).
- 1.3. Counsel patients on the risks, benefits, and alternatives to an integrative medicine treatment plan, including a discussion of existing evidence to facilitate informed decision making on integrative approaches to care.
- 1.4. Demonstrate advanced skills in assessment and treatment of patients with complex conditions, including symptoms or diseases with unexplained or poorly understood etiologies.
- 1.5. Perform competently all medical procedures or complementary medicine therapies appropriate for the fellow's area of practice.\*
- 1.6. Provide health care services aimed at preventing illness and promoting health and wellness.
  - 1.6.1. Collaborate with patients to plan and perform evidence-based health screenings for disease prevention using relevant conventional and integrative approaches.<sup>†</sup>
  - 1.6.2. Counsel patients on the evidence for integrative therapies for optimizing health and wellness.
  - 1.6.3. Educate patients on the role of lifestyle factors for optimizing health and wellness. Give adequate consideration to sleep, diet, exercise, stress, habits, relationships, community, and spirituality as potential factors influencing health.
  - 1.6.4. Demonstrate expertise in facilitating behavioral changes in patients using evidence-based strategies.<sup>‡</sup>

#### **2. Medical Knowledge**

*The integrative medicine fellow should demonstrate advanced knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences relevant to integrative medicine.*

- 2.1. Describe the scope and practice of integrative medicine including:
  - Domains of complementary and alternative medicine (CAM) as defined by the National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health.
  - Evolving role of CAM in comanagement of patients.
  - History of integrative medicine.
  - Settings in which integrative medicine care is provided.
  - Demographic and epidemiologic patterns of integrative medicine use.
  - Status of commercial and government insurance coverage for integrative services.
  - Legal and ethical issues relevant to the practice of integrative medicine.
  - Barriers to access of integrative medicine services.

*(Appendix continues)*

---

## Appendix 1 (Continued)

- 2.2. Demonstrate expert knowledge of the established and evolving evidence base for how lifestyle factors influence health and illness, including:
  - 2.2.1. The impact of emotional and physical stress on biologic markers and disease processes.
  - 2.2.2. Advanced nutrition theory and practice, such as the role of intensive diet change in the treatment of chronic disease, the impact of medications on micronutrient levels, the role of specific diets for varied diseases, and the safety and evidence for “fad” diets.
  - 2.2.3. Science of physical activity recommendations and required components of individualized exercise prescriptions.
  - 2.2.4. Knowledge of sleep disorders and impairment from sleep deprivation, including their impact on comorbidities and well-being.
  - 2.2.5. Role of social connections and spiritual beliefs to health and illness.
- 2.3. Describe the established and evolving evidence base for common CAM and traditional medical systems, including current information on effectiveness, safety, indications, contraindications, mechanisms, and interactions.
- 2.4. Describe the established and evolving evidence base for dietary supplements in the management of common medical conditions.
  - 2.4.1. List common uses, potential adverse effects, drug–supplement interactions, clinical pharmacology, and dosing for frequently encountered dietary supplements.
  - 2.4.2. Demonstrate advanced knowledge of the evidence for efficacy and safety of commonly used dietary supplements.
  - 2.4.3. Identify credible evidence-based resources for information on dietary supplements.
  - 2.4.4. Explain historic and current regulations governing dietary supplements in the United States.
  - 2.4.5. Understand the influence of dietary supplement regulations on dietary supplement clinical efficacy, safety, and quality.
- 2.5. Describe the history, philosophy, and theory for common CAM therapies and traditional medical systems.
- 2.6. Demonstrate advanced knowledge of the evidence-based integrative medicine model as applied to a range of common clinical conditions.
- 2.7. Demonstrate advanced knowledge of principles central to integrative medicine practice, including but not limited to:
  - Evidence-based medicine.
  - Medical pluralism.
  - Preventive medicine.
  - Patient-centered care.
  - Therapeutic alliance.
  - Biopsychosocial model and holism.
  - Placebo effect.
  - Cultural competence.
  - Physician self-care.
  - Behavioral change.
  - Biochemical individuality.
  - Patient self-care to enhance resiliency.

---

\*Includes medical interventions or complementary practices, such as acupuncture, relaxation training, and manipulation. Approaches used may be specific to fellow's subspecialty.

†Examples include personalized approaches to preventive care based on personal and family history, such as preventive cardiovascular testing.

‡Examples of behavior change theories and techniques include motivational interviewing and the stages of change model.