

## Nutrition Competencies in Health Professionals' Education and Training: A New Paradigm<sup>1–3</sup>

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### ABSTRACT

Most health care professionals are not adequately trained to address diet and nutrition-related issues with their patients, thus missing important opportunities to ameliorate chronic diseases and improve outcomes in acute illness. In this symposium, the speakers reviewed the status of nutrition education for health care professionals in the United States, United Kingdom, and Australia. Nutrition education is not required for educating and training physicians in many countries. Nutrition education for the spectrum of health care professionals is uncoordinated, which runs contrary to the current theme of interprofessional education. The central role of competencies in guiding medical education was emphasized and the urgent need to establish competencies in nutrition-related patient care was presented. The importance of additional strategies to improve nutrition education of health care professionals was highlighted. Public health legislation such as the Patient Protection and Affordable Care Act recognizes the role of nutrition, however, to capitalize on this increasing momentum, health care professionals must be trained to deliver needed services. Thus, there is a pressing need to garner support from stakeholders to achieve this goal. Promoting a research agenda that provides outcome-based evidence on individual and public health levels is needed to improve and sustain effective interprofessional nutrition education. *Adv Nutr* 2015;6:83–87.

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Nutrition practices have a powerful impact on the leading diet-related chronic diseases including heart disease, hypertension, type 2 diabetes, and certain cancers (1). Despite this, it is widely recognized that most health care professionals receive little nutrition training and are ill-equipped to assess their patients' diets and nutritional status as well as provide nutrition counseling (2–4). Poor nutrition also has adverse effects on the clinical course of many acute illnesses and communicable diseases (5, 6). In this symposium, the state of nutrition efforts in the

United States, United Kingdom, and Australia was reviewed by speakers who are leading the effort in these countries. The rationale for development of nutrition competencies and inter-professional nutrition education was discussed. Strategies to advance these goals from practical and policy perspectives, as well as the role of research in promoting nutrition education for health care professionals, were presented. This symposium complements the supplement published in the *American Journal of Clinical Nutrition* in May 2014 that focused on improving the nutrition education of health care professionals.

The goals of the presentations by Dr. Sharon Akabas and Dr. Douglas Seidner were the following: 1) to distinguish competency-based from structure-based (objectives) learning, 2) to review the competency framework developed by the Accreditation Council for Graduate Medical Education (ACGME)<sup>15</sup> and discuss how this can be applied to health

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<sup>15</sup> Abbreviations used: AAMC, American Association of Medical Colleges; ACGME, Accreditation Council for Graduate Medical Education; IOM, Institute of Medicine; NNEdPro, the Need for Nutrition Education/Innovation Program.

care professional training, 3) to encourage the mapping of nutrition and physical activity competencies in existing curricula, 4) to provide examples of successful competency-based interprofessional education programs, and 5) to make recommendations for next steps in the development of fundamental milestones. There is a shift in the goals of the education process from what the student “knows” to a progressive process where the student learns the additional steps “knows how,” “shows how,” and “does,” resulting in the ability to integrate this knowledge into day-to-day practice (7). This shift can promote improved nutrition assessment and integration of nutrition into patient care. This shift is accompanied by a core commitment to interprofessional education, which is one of 8 domains identified by the ACGME (8), and is an emphasis of prevention and chronic care models (9), which is a key aspect of the Patient Protection and Affordable Care Act. Practitioners are encouraged to work with other educators in their academic settings to identify milestones to assess nutrition and physical activity knowledge and skills with the goal to include these competencies in the accreditation process.

Dr. Martin Kohlmeier provided examples of the impact of appropriate nutrition education on health care outcomes and summarized the status of nutrition education in US medical schools. For example, when physicians provide nutrition guidance, their patients have fewer pregnancy complications and give birth to healthier children (10). Hospital stays and outcomes after expensive surgeries and other treatments are gaining attention because best nutrition practices save money. However, most physicians are not sufficiently prepared to deliver appropriate nutrition messages to their patients. Many ignore nutrition altogether because they lack the necessary training. Learning nutrition science and acquiring the necessary clinical skills take time. A national survey found that nutrition education at many medical schools is inadequate and not improving (4). Half of the accredited medical schools in the United States teach 17 h at most, and 9% require no nutrition education at all. About 10% of US medical schools indicate that they are able to provide  $\geq 40$  h of education within the 4-y curriculum.

Dr. Kohlmeier suggested that students will be better prepared if medical schools require a nutrition and behavior modification course as a prerequisite for admission.

Pending legislation suggests nutrition-themed continuing education for federal employees. A second bill proposes financial incentives for medical schools to improve nutrition training.

Dr. Kohlmeier cited a recent study that found that resident obstetricians who had just 1 h of online instruction implemented effective assessment and counseling tools with their pregnant patients (10). Before the training session, most of these residents rarely or never advised their patients about recommended weight gain, but 3 mo after the 1-h education session most of them did so. This is a promising start.

Dr. Carine Lenders provided an update of ongoing ASN nutrition education activities for health care professionals.

ASN is committed to research, translation, and dissemination of nutrition research to improve public health and clinical practice worldwide and to promote education and training of clinicians in nutrition. The education activities of ASN are led by a Nutrition Education Committee that is comprised of 3 subcommittees: 1) the Nutrition Education in Health Professional Schools Committee, 2) the Learning Library Committee, and 3) the Mentoring Committee.

Since 2012, the charge of the Nutrition Education in Health Professional Schools Committee has been to develop strategies to advance nutrition education and training of students and faculty in medical and other health professional schools; to interact with other societies/groups engaged in medical nutrition education and certification [e.g., the National Heart, Lung, and Blood Institute; the American Association of Medical Colleges (AAMC)]; and to represent ASN at the Institute of Medicine’s (IOM) Global Forum on Innovations in Health Professional Education. The Learning Library aims to increase nutrition education capacity via the development of web-based resources, whereas the Mentoring Committee works to develop a network of educators across the United States and award grants to medical students and physicians to facilitate nutrition education and training.

Competencies are a key aspect of any educational and training model for medical nutrition across disciplines. After discussions with collaborators from the AAMC, successful groups that have defined competencies also have the following common attributes: 1) they have primary stakeholders, 2) they have a compelling argument that focuses on need and urgency, 3) they share a defined vision and outcome as well as a comprehensive approach that includes working within the AAMC competency framework, 4) they obtain advice from certification groups (e.g., the Liaison Committee on Medical Education; the National Board of Medical Examiners), and 5) they are working to convince the US Congress that the topic is important.

ASN participates in initiatives with other health care professionals that foster innovation and advocacy. Within the last couple of years, ASN has partnered with colleagues from the IOM Global Forum on Innovations in Health Professional Education; the National Heart, Lung, and Blood Institute Working Group on Future Directions for Implementing Nutrition across the Continuum of Medical Education and Training, and for Practicing Physicians; the Global Capacity Building in Nutrition Science: Training Future Practitioners and Empowering Leaders, organized by the New York Academy of Sciences; and the Bipartisan Policy Forum on Teaching Nutrition and Physical Activity in Medical School: Training Doctors for Prevention-Oriented Care. ASN is also exploring ways to partner with other countries on medical nutrition education initiatives for health care professionals.

Funding is currently being sought to establish an ASN-led steering committee to advance medical nutrition education. A long-term effort involving multiple stakeholders, this

center would centralize efforts to monitor and promote existing efforts and resources, develop needed tools, evaluate implementation, and disseminate findings.

The need for nutrition education for health care professionals is recognized worldwide. The symposium featured presentations about efforts in the United Kingdom and Australia.

Dr. Sumantra Ray, Pauline Douglas, and Celia Laur discussed the Need for Nutrition Education/Innovation Program (NNEdPro; [www.nnedpro.org.uk](http://www.nnedpro.org.uk)), a practical application of introducing nutrition into competency-based medical education in a United Kingdom context. The NNEdPro Group was developed in 2008 to increase awareness among medical/health care professionals regarding the importance of clinical and public health nutrition. It is a virtual strategic partnership between physicians, dietitians, nutritionists, and other health care professionals. It is comprised of several partner organizations including the British Dietetic Association, the Society for Nutrition Education and Behavior, the Cambridge University Hospitals/School of Clinical Medicine, the University of Ulster, and the U.K. Medical Research Council Human Nutrition Research Unit in Cambridge, United Kingdom.

The NNEdPro Group has pursued a phased approach to the generation of evidence justifying the need for medical nutrition education and has evaluated the impact of innovation in educational delivery in medical students, junior physicians and latterly specialized physicians, and other health care professionals (11–13). Evaluation methods have included examining pre- and post-training scores for changes to knowledge, attitudes, and practices, along with qualitative feedback and assessment of confidence vs. competence. As part of strengthening the platform upon which this work is based, NNEdPro has established a vertical curriculum strand within the University of Cambridge School of Clinical Medicine (13). In addition, these approaches to medical nutrition education have led to work geared at strengthening the nutrition evidence base in certain key areas of medical importance. Another innovative approach that has been used by the NNEdPro Group is the combination of nutrition training with change management (this denotes the systematic management of stepped changes that are required to bring about a shift in processes leading to improved outcomes) to provide both knowledge and the advocacy skills to translate such knowledge in practical settings (12). In the next phase of work, the group will build upon the local innovation that is having an unexpected global impact because of a number of parallels in medical nutrition education across countries and continents. This innovation and impact have led the group into some of the policy aspects of education, including the understanding that the need for nutrition education may also equate to the need for nutrition education regulation. The future direction for the NNEdPro Group includes expansion of teaching into other specialties including other health care professionals and other topics including hydration awareness. The group is also continuing to foster global partnerships to provide a unified voice for medical nutrition education.

Dr. Caryl Nowson discussed nutrition education for health care professionals in the context of Australian medical education. Australia currently has ~3000 medical students graduating each year from 18 entry-level medical courses (configured as 6-y undergraduate courses and 4-y postgraduate courses). Course accreditation guidelines are that medical graduates should be able to apply nutrition knowledge in practice; however, there are no nutrition competencies formally integrated into Australian medical courses (14).

In 2013 Dr. Nowson and her team (a collaboration of 4 entry-level medical courses and the Dietitians Association of Australia) were awarded an Office for Learning and Teaching government grant (2013–2015). The aim of this project is to develop a web-based nutrition competency implementation toolkit (<http://wncit.weebly.com/>) that will enable medical courses to effectively embed nutrition competencies within curricula and ensure that all medical graduates are “nutritionally competent.” The toolkit is based on a nutrition competency framework of 4 knowledge-based and 5 skill-based competencies that incorporate learning outcomes. The toolkit will include an online curriculum mapping tool to map courses for nutrition competencies, a set of quality nutrition teaching exemplars (including a bank of multiple choice questions), a collation of web-based nutrition education resources, and an instruction manual. All components of the toolkit will be stringently evaluated and refined to develop quality modules.

The immediate challenges to effectively integrating nutrition into medical education are endorsement of the nutrition competency framework from the Australian Medical Council (which develops standards for medical education and training) and the Medical Deans Australia and New Zealand, Inc. (the peak body representing professional entry-level medical education, training, and research), effective dissemination of the web-based nutrition competency implementation toolkit to the key stakeholders, and general consensus on the level of practical nutrition skill levels appropriate for medical graduates.

In his presentation, Dr. Matthew Levy argued persuasively for the need for policy advocacy that is focused on nutrition education for health care professionals. As stated earlier, poor nutrition practices and physical inactivity are leading risk factors for many prevalent and costly chronic conditions; however, most health care professionals are not adequately trained to counsel patients on the components of a healthy lifestyle. In recent years, changes in the health care delivery and financing landscape, such as the passage of the Affordable Care Act, have led governmental agencies and nongovernmental organizations to increasingly develop policies and programs that support a public health focus on prevention and treatment of chronic diseases through better nutritional awareness, assessments, and counseling. Unfortunately, “[Health] professional education has not kept pace with [the health care delivery challenges] largely because of fragmented, outdated, and static curricula that produce ill-equipped graduates” (3). Some of the barriers to improving health professional education include

the limited number of physician champions in health professional schools, limited penetration of nutrition into curricula because of competition for time, limited reimbursement for nutrition counseling as a separate visit, limited coordinating strategies across health care professional sectors, and some disagreement about what the appropriate role is of various providers in delivering such information (15). As noted in the recent article in the *American Journal of Clinical Nutrition*, health care professionals must seize this opportunity to improve the health of patients by advocating for the following: 1) realigning the training of health care professional students and residents by looking at *outcomes-driven education* and develop effective longitudinal, educational interprofessional strategies that align individual health with population health, 2) training all health care professionals in the nutrition and physical activity needs of our growing population and develop standard nutrition fellowship training programs, and 3) aligning incentives such as reimbursement and licensure to support increased focus on nutrition and physical activity in practice and motivate providers to want to change (16).

Dr. Charlotte Pratt presented the rationale for, and status of, research opportunities in the area of nutrition education for health care professionals. Many nutrition educators and health care professionals have called for research to evaluate the effectiveness of innovative teaching strategies, to test various approaches to implement curricular changes, and assess the effects of such approaches on patient and population health (2, 17, 18). As new knowledge in nutrition evolves, physicians and other health care professionals must be poised to incorporate the knowledge and skills in their professional practice. Research that evaluates new approaches for longitudinal incorporation of nutrition in medical training for medical students, residents, fellows, and other health care professionals through use of new technologies and training modules is needed. Research is also needed to evaluate nutrition education programs at all levels of medical education and for other health care professionals such as nurses, dentists, and pharmacists. A key research question would be does longitudinal integration of nutrition in the curriculum impact health care professionals' and/or patient health outcomes (e.g., diet, physical activity, and chronic disease risk)?

Interprofessional education has been promoted by the IOM and adopted by the AAMC, ACGME, and other professions (19, 20). Research is needed to examine how interprofessional nutrition education with multidisciplinary teams contributes to more coordinated care, better performance, and improved patient outcomes. A key research question would be whether such multidisciplinary teams better facilitate the integration of nutrition and physical activity into the medical school curriculum (e.g., cardiovascular curriculum) or change the eating habits, physical activity, or chronic disease risks of patients? The use of electronic medical records and monitoring devices provide opportunities for accomplishing such tasks.

## Conclusion

There is growing recognition that health care professionals must be better trained in nutrition to provide optimal patient care and, thereby, contribute to improved population health (3). This will require a competency-based nutrition education approach for health care professionals that addresses clinical and public health nutrition for the prevention and treatment of many acute, communicable, and chronic diseases. There is an upsurge of interest in revamping medical nutrition activities for all health care professionals. It is essential that this momentum be maintained. Moreover, strategies must be identified that coordinate and grow this effort among interested stakeholders. It is impressive that there are ongoing global activities that address the need for nutrition education for health care professionals. Working together will be essential to improve nutrition knowledge of all health care professionals. It is evident that achieving this goal expediently is in the best interests of all concerned stakeholders. Furthermore, making progress toward improved patient care will achieve significant population health benefits. The authors acknowledge the ongoing activities that are directed toward improving medical nutrition education and the commitment of so many individuals who are pursuing this goal.

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## References

1. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, AlMazroa MA, Amann M, Anderson HR, Andrews KG, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012;380:2224–60. Erratum in: *Lancet* 2013 Feb 23;381:628; and *Lancet* 2013 Apr 13;381:1276.
2. Kris-Etherton PM, Akabas SR, Bales CW, Bistrian B, Braun L, Edwards MS, Laur C, Lenders CM, Levy MD, Palmer CA, et al. The need to advance nutrition education in the training of health care professionals and recommended research to evaluate implementation and effectiveness. *Am J Clin Nutr* 2014;99:1153S–66S.
3. Frenk J, Chen L, Bhutta ZA, Cohen J, Crisp N, Evans T, Fineberg H, Garcia P, Ke Y, Kelley P, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet* 2010;376:1923–58.
4. Adams KM, Kohlmeier M, Zeisel SH. Nutrition education in U.S. medical schools: latest update of a national survey. *Acad Med* 2010;85:1537–42.
5. Mehta NM, Bechard LJ, Cahill N, Wang M, Day A, Duggan CP, Heyland DK. Nutritional practices and their relationship to clinical outcomes in critically ill children—an international multicenter cohort study. *Crit Care Med* 2012;40:2204–11.
6. Higashi T, Shekelle PG, Adams JL, Kamberg CJ, Roth CP, Solomon DH, Reuben DB, Chiang L, MacLean CH, Chang JT, et al. Quality of care is associated with survival in vulnerable older patients. *Ann Intern Med* 2005;143:274–81.
7. van der Vleuten CPM, Schuwirth LWT. Assessing professional competence: from methods to programmes. *Med Educ* 2005;39:309–17.
8. Englander R, Cameron T, Ballard AJ, Dodge J, Bull J, Aschenbrenner CA. Toward a common taxonomy of competency domains for the health professions and competencies for physicians. *Acad Med* 2013;88:1088–94.
9. Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model, part 2. *JAMA* 2002;288:1909–14.

10. Kaplan BS, Karkowsky CE, Kohlmeier M, Dayal A, Chazotte C, Nutrition EL. In medicine: effectiveness of a web-based curriculum for obstetrics and gynecology residents. *FASEB J* 2013;27:47.7.
11. Ray S, Udumyan R, Rajput-Ray M, Thompson B, Lodge K-M, Douglas P, Sharma P, Broughton R, Smart S, Wilson R, et al. Evaluation of a novel nutrition education intervention for medical students from across England. *BMJ Open* 2012;2:e000417.
12. Ray S, Laur C, Douglas P, Rajput-Ray M, van der Es M, Redmond J, Eden T, Sayegh M, Minns L, Griffin K, et al. Nutrition education and leadership for improved clinical outcomes: training and supporting junior doctors to run 'Nutrition Awareness Weeks' in three NHS hospitals across England. *BMC Med Educ* 2014;14:109.
13. Ball L, Crowley J, Laur C, Rajput-Ray M, Gillam S, Ray S. Nutrition in medical education: reflections from an initiative at the University of Cambridge. *J Multidiscip Healthc* 2014;7:209–15.
14. Nowson C. Nutrition competencies for the prevention and treatment of disease in Australian medical courses. *Med J Aust* 2012;197:147.
15. Dimaria-Ghalili RA, Edwards M, Friedman G, Jaferi A, Kohlmeier M, Kris-Etherton P, Lenders C, Palmer C, Wylie-Rosett J. Capacity building in nutrition science: revisiting the curricula for medical professionals. *Ann N Y Acad Sci* 2013;1306:21–40.
16. Levy MD, Loy L, Zatz LY. Policy approach to nutrition and physical activity education in health care professional training. *Am J Clin Nutr* 2014;99:1194S–201S.
17. Kushner RF, Van Horn L, Rock CL, Edwards MS, Bales CW, Kohlmeier M, Akabas SR. Nutrition education in medical school: a time of opportunity. *Am J Clin Nutr* 2014;99:1167S–73S.
18. Lenders CM, Deen DD, Bistran B, Edwards MS, Seidner DL, McMahon MM, Kohlmeier M, Krebs NE. Residency and specialties training in nutrition: a call for action. *Am J Clin Nutr* 2014;99:1174S–83S.
19. DiMaria-Ghalili RA, Mirtallo JM, Tobin BW, Hark L, Van Horn L, Palmer CA. Challenges and opportunities for nutrition education and training in the health care professions: intraprofessional and interprofessional call to action. *Am J Clin Nutr* 2014;99:1184S–93S.
20. Core competencies for interprofessional collaborative practice: report of an expert panel. In: Panel IECE, editor. *Interprofessional Education Collaborative Expert Panel*. Washington, DC: Interprofessional Education Collaborative Expert Panel; 2011.