

Nutrition Integration into Medical School Curricula

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Disclosures

- I disclose the following financial relationships with commercial entities that produce health care-related products or services relevant to the content I am planning, developing, or presenting

<u>Company</u>	<u>Relationship</u>
UpToDate	Author
American Society for Nutrition	Editor-in-Chief, the AJCN

Outline

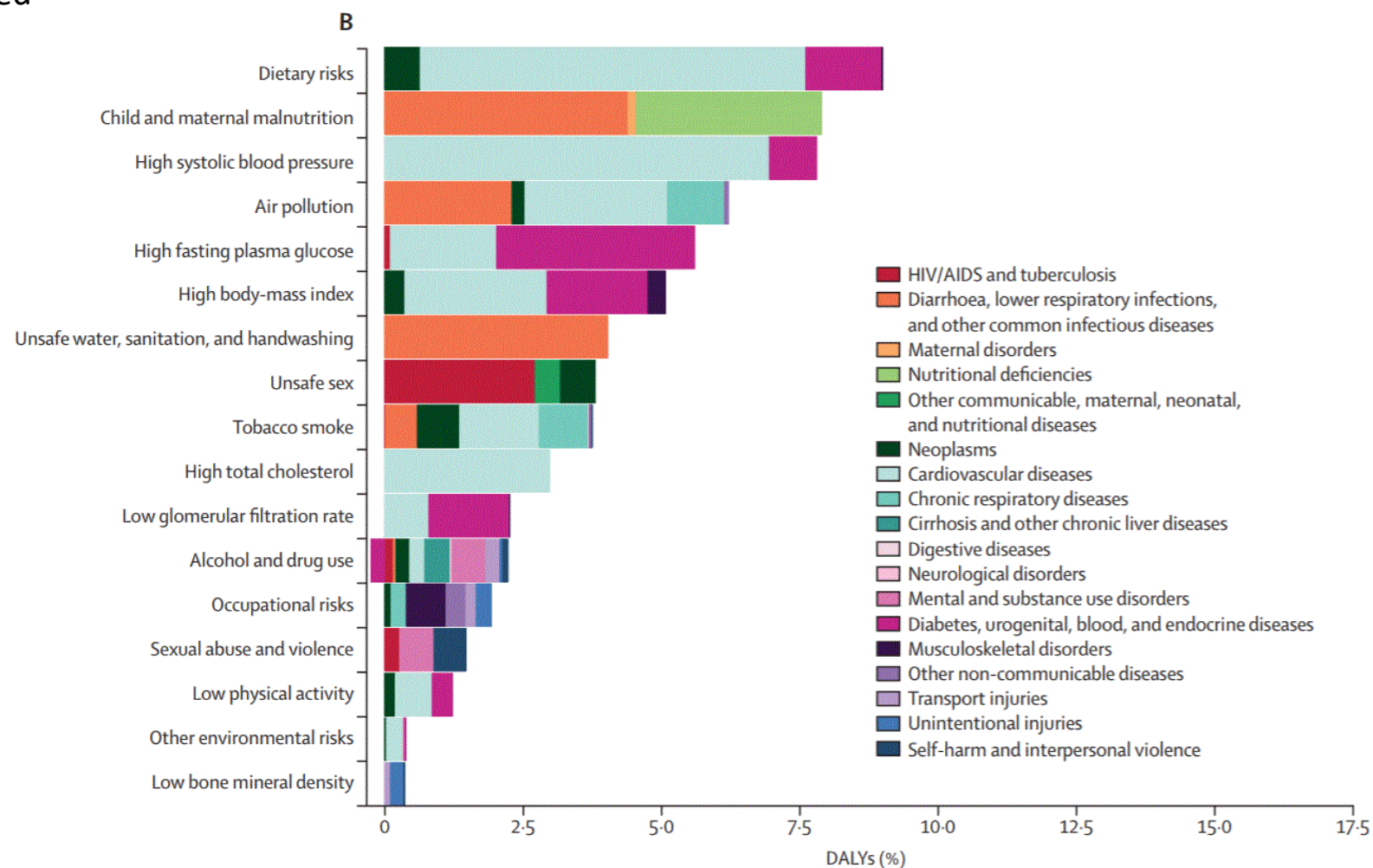
- Rationale for nutrition education in medical school
- Undergraduate nutrition education at Harvard Medical School
- Is an integrating approach effective?
- HR 1118
- March 2023 meeting at ACGME
- Way forward

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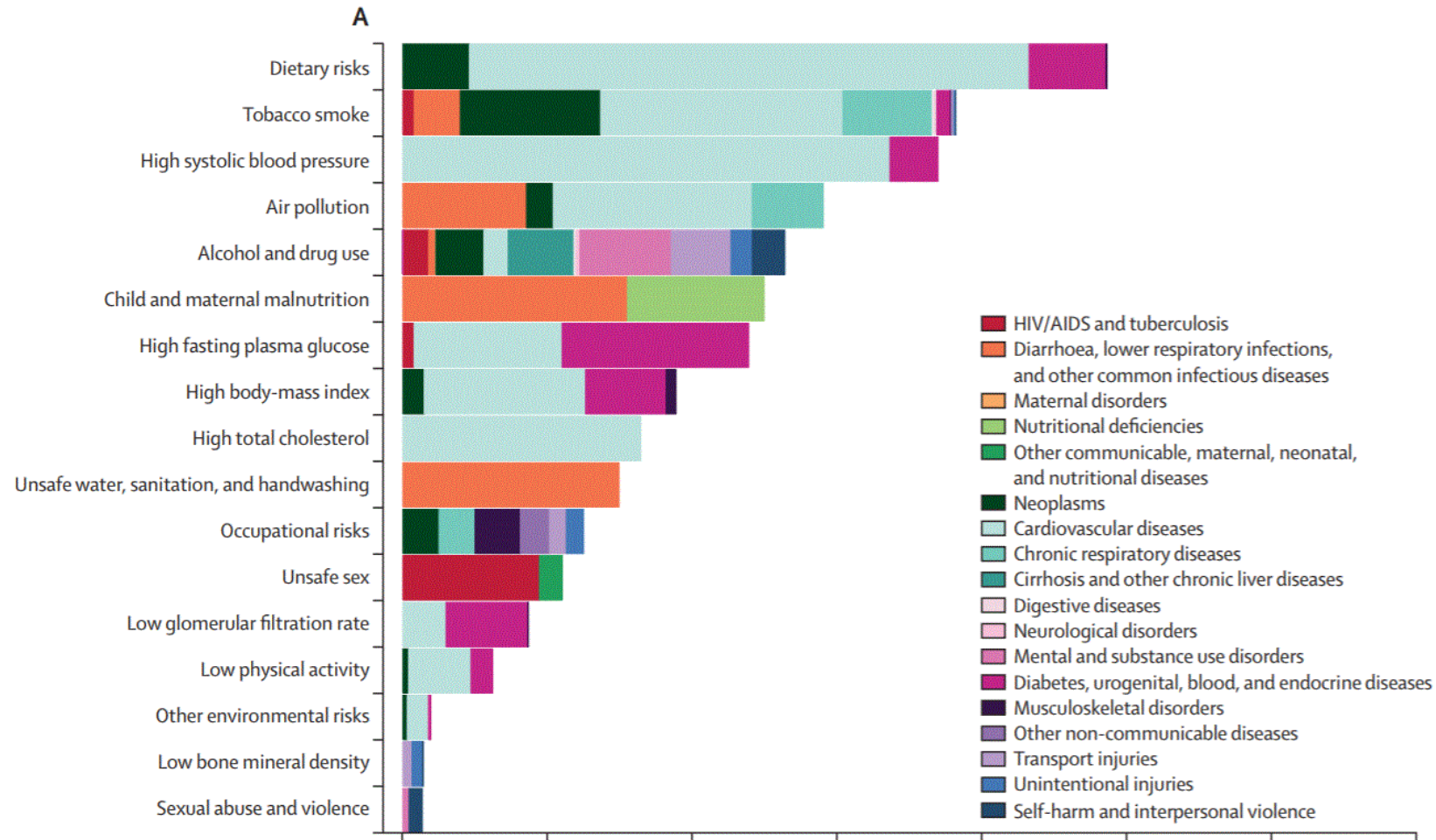
Global DALYs attributable to risk factors for women

DALYs = disability-adjusted life years



From Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*. 2016;388(10053):1659-1724.

Global DALYs attributable to risk factors for men



The State of Nutrition Education at US Medical Schools

Kelly M. Adams,¹ W. Scott Butsch,² and Martin Kohlmeier^{1,3}

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TABLE 1: Nutrition instruction hours in various contexts at US medical schools that taught nutrition during the 2012/2013 academic year*.

Course/context	Nutrition	Integrated	Biochemistry	Physiology	Clinical practice
Number of schools	22	82	45	35	55
Number of hours of nutrition instruction in this context, average (SD)	13.8 (7.3)	12.6 (10.4)	6.4 (6.0)	4.2 (3.2)	6.4 (6.6)
Total 4-year nutrition curriculum hours at schools using nutrition instruction in this form, average (SD)	22.2 (8.6)	22.1 (13.7)	21.7 (11.4)	23.1 (11.7)	24.2 (14.8)
Percent of total instruction provided in that course/context, average (SD)	66.7 (27.5)	60.3 (31.3)	31.8 (27.6)	24.3 (25.6)	25.1 (14.4)

*121/133 US medical schools responded to a survey that began in 2012. Most schools that provided nutrition education did so in more than one type of course or context. SD indicates standard deviation.

The State of Nutrition Education at US Medical Schools

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TABLE 2: Required nutrition education hours at US medical schools over time*.

	2000	2004	2008	2012
Average hours of required nutrition education (SD)*	20.4 (13.6)	22.3 (15.3)	19.5 (13.5)	19.0 (13.7)
Median hours of required nutrition education	18	20	16	17
Schools with a required nutrition course, number/total (%)	39/112 (35%)	32/106 (30%)	26/105 (25%)	22/121 (18%)
Response rates, number/total (%)	100/112 (89%)	89/106 (84%)	90/105 (86%)	121/133 (91%)

* All US medical schools were surveyed using identically worded core questions during four academic years: 2000/2001, 2004/2005, 2008/2009, and 2012/2013. SD indicates standard deviation.

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Nutrition Education in Medical School, Residency Training, and Practice

Nutrition education in medical school is rudimentary, at best, and limited for the duration of graduate medi-

to adequately advance without a solid foundation in clinical nutrition.

An inevitable question arises: with myriad topics in need of more attention in medical training, why is nutrition a priority? There are 4 reasons why nutrition education deserves special attention:

1. A 2018 report by the US Burden of Disease Collaborators identified poor-quality diet as the leading cause of death in the United States.⁴ The prevalence and cost of diet-related diseases are predicted to continue to climb if left unchecked.

2. There is renewed interest in a shift in health care from disease management to health promotion and prevention, areas that physicians will find difficult

to adequately advance without a solid foundation in clinical nutrition. is reflected in what physicians report about their training. In a 2017 survey of 646 cardiologists, 90% reported that they had not received adequate nutrition education to counsel their patients, even though 95% believed it was their personal responsibility to do so.⁸

Some might suggest that physicians do not need to be educated about nutrition because other health care professionals, including dietitians, are better trained and positioned to make dietary recommendations. But guiding patients to make dietary changes is a team effort and can include appropriately trained dietitians, nutritionists, nurses, health coaches, and chefs. The problem is

VIEWPOINT

Nutrition Education in Medical School, Residency Training, and Practice

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Nutrition education in medical school is rudimentary, at best, and limited for the duration of graduate medical education for many specialties. Requirements for meaningful nutrition education in all phases of medical training are long overdue.

In randomized clinical trials, dietary interventions have proven to both prevent and manage important diseases, such as diabetes and cardiovascular disease.^{1,2} For example, compared with control groups, a Mediterranean-style diet was shown to reduce recurrent cardiovascular events by 72% (absolute difference, 2.83 events per year).¹ In individuals with elevated fasting blood glucose, a combination of dietary changes and physical activity reduced the risk of developing diabetes by 58% (absolute difference, 6.2 cases per 100 person-years), compared with a 31% reduction in individuals receiving metformin (absolute difference, 3.2 cases per 100 person-years).² However, the substantial body of evidence that supports the benefits of nutritional interventions has not adequately translated into action in medical training or practice.

Current clinical care guidelines cite nutrition as a

to adequately advance without a solid foundation in clinical nutrition.

3. **Patients are barraged by information on diet and health from the media, and physicians need to be knowledgeable in this area** to help patients interpret and act on the confusing, and often contradictory, nutrition messages in the public domain.

4. **There is increasing attention on the wellness and self-care of residents and fellows.** Lessons learned by physicians-in-training about clinical nutrition might not only serve to improve patient health, but also have the potential to enhance physician self-care through greater awareness and knowledge of the dietary influences on well-being. This knowledge in turn can help make physicians more effective counselors.

Beginning with medical school, the time devoted to nutrition is limited, with an average of 19 total hours over 4 years, and is focused largely on biochemistry and vitamin deficiency states.⁵ This is an incorrect focus, because diseases related to nutritional deficiencies, such as scurvy and beriberi, are not major problems in the United States. Following medical school, nutrition education during the 3 or more years of graduate medical

NUTRITION EDUCATION

IN U.S. MEDICAL SCHOOLS



”Among the major deficiencies in nutrition education identified through these efforts were a failure to provide administrative and institutional support for teaching nutrition, a lack of adequately trained faculty, and the absence of a defined place for nutrition in the curriculum. Despite repeated recommendations to remedy these shortfalls, a widespread perception persists that nutrition is not given the same recognition in the medical curriculum as other scholarly disciplines.”

National Research Council. 1985. Nutrition Education in U.S. Medical Schools.
Washington, DC: The National Academies Press.
<https://doi.org/10.17226/597>.

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Nutrition Education at Harvard Medical School

- 1996 – Formation of Division of Nutrition
 - P30 Nutrition Obesity Research Center; Nutrition Academic Award NHLBI; T32 Program in Academic Nutrition
- Annual HMS/NORCH symposium
- Monthly Longwood Nutrition Rounds
- 1998 – 2007
 - Nutrition and Preventive Medicine course for all HMS2 students
 - 7 sessions on Nutrition
- 2007 – 2010
 - Preventive Medicine and Nutrition course for all HMS2 students
 - 3 sessions on Nutrition
- 2010 – course eliminated

Nutrition Education at Harvard Medical School

- 1995 – present
 - Elective in Pediatric Nutrition
- 2019 – present
 - Advanced Integrated Science Course “Nutrition, Metabolism and Lifestyle Medicine”, selective for HMS3 and HMS4 students (n = 20 – 25/year)
- 2019 – present
 - Integrated curricular theme Nutrition and Lifestyle Medicine
- 2022 – present
 - Student interest group in Nutrition
- 2023 – present
 - Elective in Culinary Medicine

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Nutrition and Lifestyle Medicine Theme

Edit



Welcome to the Nutrition and Lifestyle Medicine Theme Page!

Overarching goal: Acquire knowledge and skills to encourage adoption and maintenance of healthy diet and active lifestyle to optimize health, and prevent or treat medical conditions across our populations.

- [Healthy Eating Plate](#) ↓ pocket card
- [Nutrition Counseling in Clinical Practice](#) ↓
- [Video on Nutrition Counseling](#) ↗

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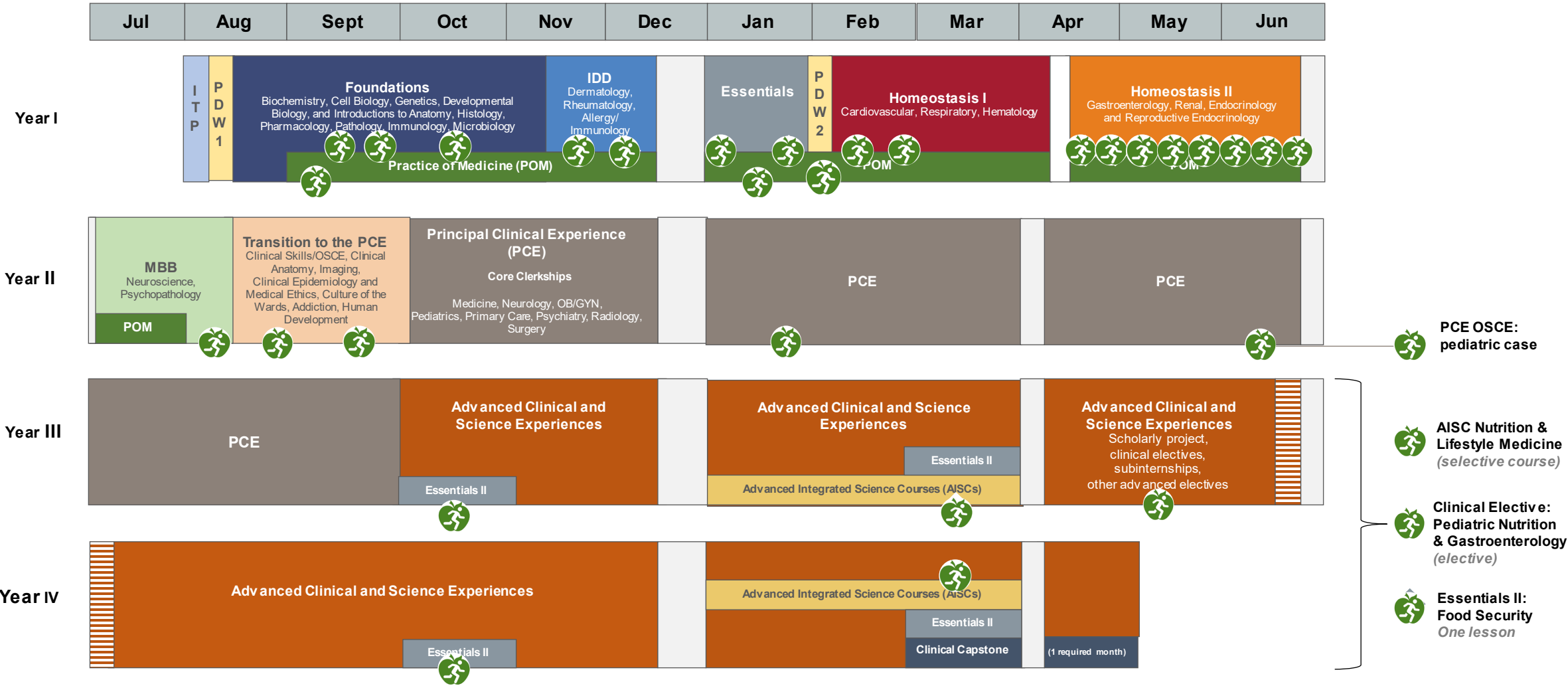
View Course Notifications

Coming Up

3 View Calendar

Nothing for the next week

Harvard Medical School - Nutrition Theme Curriculum Map



Thanks to Sanjay Gadi (HMS 2022), and to Grace Nickel and Anthony Zhong

Comprehensive integration of nutrition into medical training¹⁻⁴

Nancy F Krebs and Laura E Primak

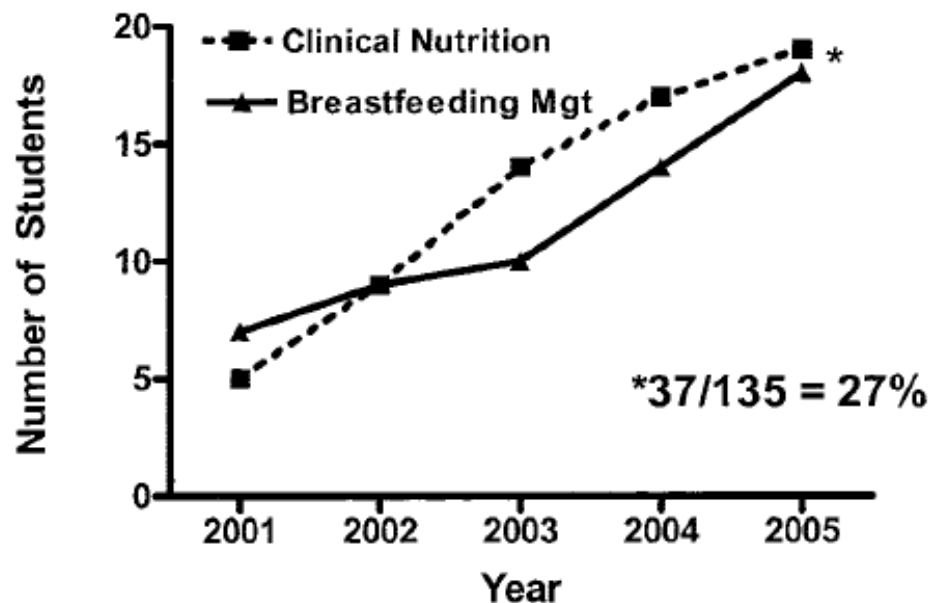


FIGURE 2. Numbers of fourth-year medical students taking the nutrition electives over the years of the Nutrition Academic Award. The total class size was 135 students. Mgt, management.

TABLE 1

Key elements of a vertically integrated nutrition curriculum in medical training

- 1) Identify a core group of committed, knowledgeable faculty (role models)
- 2) Integrate nutrition content into existing courses and training formats, with minimal demands for increases in curriculum time
- 3) Integrate nutrition in the context of clinical training, with the goal of nutrition being part of the fabric of routine clinical practice
- 4) Provide recurrent “doses” of nutrition over the 4 y of medical school, and provide reinforcement through resident and faculty training
- 5) Identify and support a coordinator (eg, a clinically experienced registered dietitian) for education initiatives

Advancing Nutrition Education, Training, and Research for Medical Students, Residents, Fellow Attending Physicians, and Other Clinicians: Building Competencies and Interdisciplinary Coordination

Linda Van Horn,¹ Carine M Lenders,² Charlotte A Pratt,³ Bettina Beech,⁴ Patricia A Carney,⁵ William Di Timothy Harlan,⁸ Robert Hash,⁹ Martin Kohlmeier,¹⁰ Kathryn Kolasa,¹¹ Nancy F Krebs,¹² Robert F Kus Janet Lindsley,¹⁵ Susan Meacham,³ Holly Nicastro,¹⁶ Caryl Nowson,¹⁷ Carole Palmer,¹⁸ Miguel Paniag Sumantra Ray,²¹ Suzanne Rose,²² Marcel Salive,²³ Marsha Schofield,²⁴ Kathryn Thompson,²⁵ Jennifer I Jeffrey D White,²⁸ Giovanna Zappalà,²⁹ Ashley Vargas,³⁰ and Christopher Lynch³¹

Adv Nutr 2019; 10:1181S-1200S

Residency and specialties training in nutrition: a call for action^{1–4}

Carine M Lenders, Darwin D Deen, Bruce Bistrian, Marilyn S Edwards, Douglas L Seidner, M Molly McMahon, Martin Kohlmeier, and Nancy F Krebs

ABSTRACT

Despite evidence that nutrition interventions reduce morbidity and mortality, malnutrition, including obesity, remains highly prevalent in hospitals and plays a major role in nearly every major chronic disease that afflicts patients. Physicians recognize that they lack the education and training in medical nutrition needed to counsel their patients and to ensure continuity of nutrition care in collaboration with other health care professionals. Nutrition education and training in specialty and subspecialty areas are inadequate, physician nutrition specialists are not recognized by the American Board of Medical Specialties, and nutrition care coverage by third payers remains woefully limited. This article focuses on residency and fellowship education and training in the United States and provides recommendations for improving medical nutrition education and practice. *Am J Clin Nutr* 2014;99(suppl):1174S–83S.

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117TH CONGRESS
2D SESSION

H. RES. 1118



Expressing the sense of the House of Representatives that the United States recognizes the mounting personal and financial burden of diet-related disease in the United States and calls on medical schools, graduate medical education programs, and other health professional training programs to provide meaningful physician and health professional education on nutrition and diet.



Updated September 29, 2022

Medicare Graduate Medical Education Payments: An Overview

Medicare makes a significant investment in medical residency training (or graduate medical education, GME). It paid an estimated **\$16.2 billion** in FY2020, primarily to hospitals. The Government Accountability Office found that Medicare is the largest federal source of GME funding, which also includes Medicaid, the Department of Defense, the Department of Veterans Affairs, the Children's Hospital GME, and Teaching Health Center GME programs.

Whereas GME programs receiving Federal funding do not consistently include substantive curricular requirements or performance benchmarks relevant to diet or nutrition;

Whereas in the absence of Federal requirements, all levels of medical training are largely devoid of nutrition education for medical professionals—

(1) at the Undergraduate Medical Education (UME) level, medical schools devote on average only 19 hours to nutrition science and diet over 4 years, or less than one percent of all lecture hours;

(2) at the GME level, requirements for nutrition curriculum and competency are limited or absent from the educational standards for key medical specialties, set by the accrediting body, the Accreditation Council for Graduate Medical Education (ACGME); and

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Accreditation Council for Graduate Medical Education

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March 15, 2023



ACGME Hosts Summit on Medical Education in Nutrition

[ACGME News](#)

Earlier this week the ACGME hosted a Summit on Medical Education in Nutrition in collaboration with the American Association of Colleges and Osteopathic Medicine and the Association of American Medical Colleges. The event brought together 100 medical education stakeholders to discuss what residents and fellows need to know about nutrition to give them the confidence and competence to care for their patients, as well as how resident/fellow nutrition education fits into the continuum of medical education.

The event was inspired by the ACGME's engagement with the Congressional "Food Is Medicine" Caucus, which has called on medical educators to ensure medical students, residents, and fellows receive nutrition education that demonstrates the

connection between diet and disease. The Summit was first announced last fall as part of the ACGME's commitment following participation in the Biden-Harris Administration National Strategy on Hunger, Nutrition, and Health and accompanied conference calls for increased education on nutrition for physicians and other professionals.

The Summit began with a keynote address on the current state of food and nutrition policy, delivered by Dr. Dariush Mozaffarian, a cardiologist from the Friedman School of Nutrition Science and Policy working to translate and disseminate scientific evidence on nutrition into public awareness, policy, and innovation. He highlighted the need for and success of efforts to increase residency education in nutrition. "Residents and fellows again and again indicate that they want more education in nutrition," said Dr. Mozaffarian. "When [they] have been given such education, nutrition curricula led to improved competence, understanding, assessment, and counseling around nutrition and improved [their] own dietary habits."

The rest of the meeting featured panel discussions and group work, where participants discussed strategies and approaches to identifying, developing, and assessing competencies related to nutrition in undergraduate and graduate medical education. These conversations addressed how to provide learners with the necessary clinical experience and education on the cultural and structural aspects of nutrition, while underscoring the importance of working with dietitians and nutritionists as part of the health care team.

The Summit provided an opportunity for medical education stakeholders to come together to explore strategies for integrating nutrition and food insecurity into the medical education curricula while emphasizing health equity and interprofessional care. With that aim in mind, the Summit concluded with small and large group work codifying key learnings and refined recommendations from the group. The findings will be memorialized in a proceedings paper that will be shared with the medical education community to support action on this critical topic.

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Summit on Medical Education in Nutrition
March 12-14, 2023
ACGME Office, Chicago, Illinois

Foundational Competencies for Undergraduate Medical Education

The Association of American Medical Colleges (AAMC), the American Association of Colleges of Osteopathic Medicine (AACOM), and the Accreditation Council for Graduate Medical Education (ACGME) are co-sponsoring an initiative to create a common set of foundational competencies for use in undergraduate medical education programs in the United States.

This initiative aligns with recommendations outlined in the [Undergraduate Medical Education-Graduate Medical Education Review Committee \(UGRC\)](#) report and is part of a comprehensive effort by all three organizations to [improve the transition to residency](#).

This initiative will have significant impact on medical students and academic medicine for years to come. The co-sponsoring organizations are committed to capturing and incorporating diverse voices from across academic medicine.



Please provide your input by responding to the questions below. The steering committee for this initiative will review all feedback collected.

Please email CBME@aamc.org with additional comments or questions.

The AAMC, ACGME and AACOM are seeking your input to help us develop a common set of foundational competencies in undergraduate medical education. The information you provide will be used to inform the recommendations of the working group. Your information may also be used to inform other research activities. We intend to publish our findings and present at academic conferences. All health care industry professionals are invited to provide input. Participating in this activity is voluntary. All information collected through this form is anonymous. The information you provide will be shared between the three organizations noted above. We may release de-identified responses to individuals who agree to protect it and who agree to the AAMC, ACGME & AACOM confidentiality policies. This activity has been reviewed according to AAMC policies and procedures. If you have any questions about this form, please contact the project team at cbme@aamc.org. By continuing, you acknowledge that you have read the above and agree to participate.

What should we expect all medical students to be able to do, know, and value regardless of their future specialty in the following six domains of competence (professionalism, patient care and procedural skills, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, and systems-based practice)? *Note: maximum 4,000 characters.*

For those working in medical education, what frameworks for competency-based education (CBE) are currently being used? How is "used" defined at the local school level? *Note: maximum 4,000 characters.*

What are the implications to adopting a common set of competencies across undergraduate medical education (UME) that align with graduate medical education (GME)? *Note: maximum 4,000 characters.*

What does success look like once the new foundational competencies are available and beginning to be implemented? *Note: maximum 4,000 characters.*

Please share any additional feedback. *Note: maximum 4,000 characters.*

Submit



What is a competency?

- An observable ability of a health professional, integrating multiple components such as knowledge, skills, values and attitudes.

Frank, JR, Snell LS, ten Cate O, et. al. Competency-based medical education: theory to practice. Med Teach. 2010; 32: 638–645

Nutrition education in medical school: a time of opportunity^{1–4}

Robert F Kushner, Linda Van Horn, Cheryl L Rock, Marilyn S Edwards, Connie W Bales, Martin Kohlmeier, and Sharon R Akabas

TABLE 1
Proposed core nutrition competencies for medical students¹

Proposed core nutrition competency
Level 1 (years 1 and 2: preclinical)
1) Micronutrients and macronutrients—Dietary Reference Intakes
2) Energy metabolism—calculating basal energy expenditure, body composition
3) Nutrition assessment—BMI, weight gain/loss, nutrient deficiencies
4) Nutrient requirements throughout the life cycle
5) Taking a diet/physical activity history, prescription for physical activity
6) Stages of change—5 A’s of counseling patients
Level 2 (years 3 and 4: clinical clerkships and transition to residency)
1) Nutrition in health promotion and disease prevention—US Dietary Guidelines and Healthy People 2020
2) NIH guidelines for prevention and treatment of obesity, diabetes, hypertension, coronary artery disease, cancer, osteoporosis—ATPIII, DASH, etc
3) Outpatient and inpatient nutrition management—medical nutrition therapy for acute and chronic disease
4) Critical care—enteral and parenteral nutrition
5) Referral to an RD for nutrition consult

¹ ATPIII, Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults; DASH, Dietary Approaches to Stop Hypertension; RD, registered dietitian; 5 A’s, Ask, Advise, Assess, Assist, Arrange.

Additional (suggested) competencies for Pediatrics Programs

- Perform a basic diet history and utilize findings to develop age-appropriate dietary recommendations.
- Assessment and initial guidance of nutrition-based interventions that promote health and aid in the management of disease states.
- Locating, appraising, and assimilating evidence from scientific studies related to health promotion of their patients, including nutrition and physical activity, as well as studies that relate to their health problems.
- Education of residents and faculty members in the science that underlies the connection between nutrition/lifestyle and well-being and how that knowledge can be applied to clinician self-care.

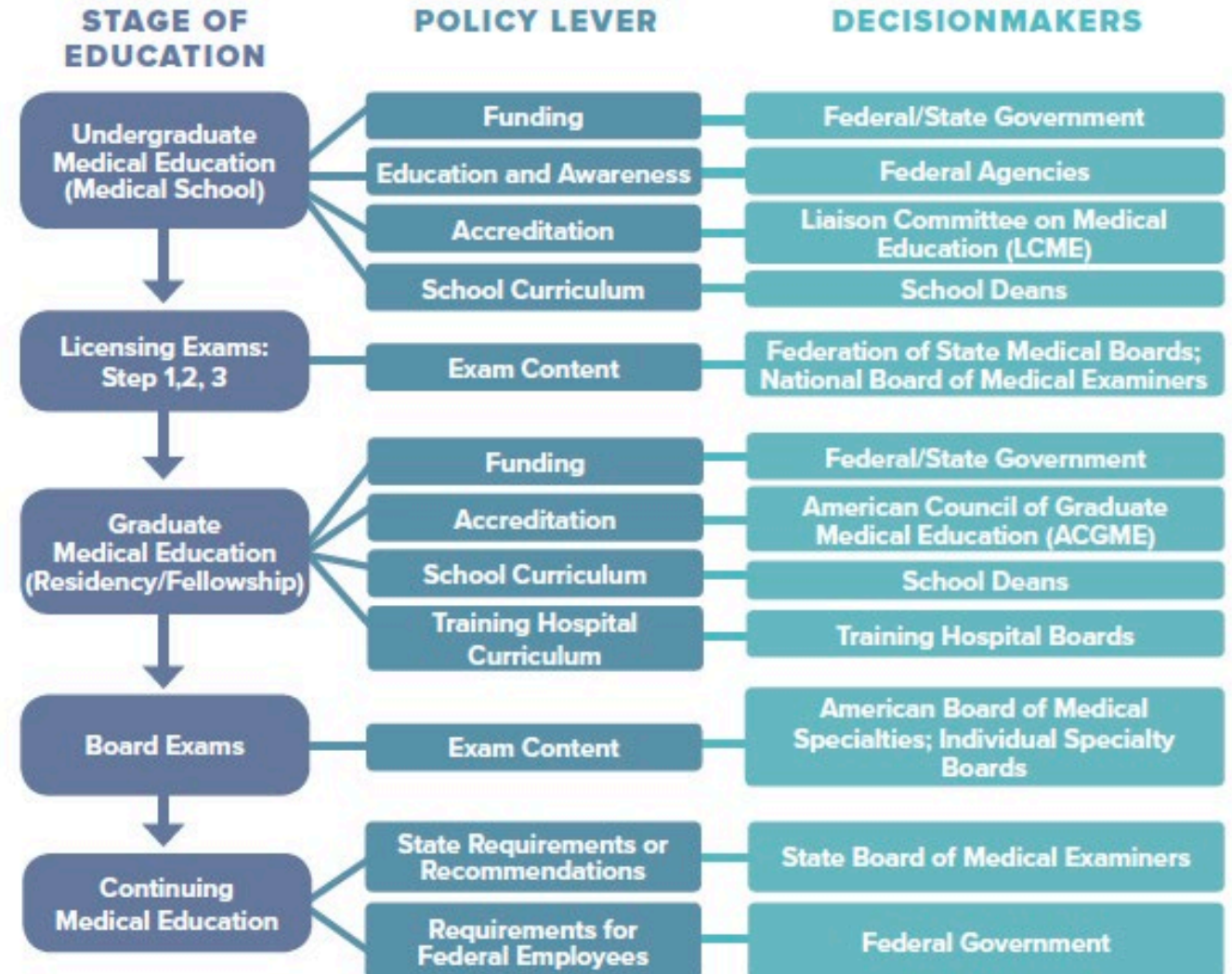
Courtesy of Drs. Steve Devries, Walter Willett, Emily Broad Lieb, Christopher Duggan, Bruce Bistrian, Marie-France Hivert and others

DOCTORING OUR DIET

Policy Tools to Include Nutrition
in U.S. Medical Training



OPPORTUNITIES TO IMPLEMENT NUTRITION EDUCATION FOR PHYSICIANS



Broad-Lieb et al., September 2019

https://chlpi.org/wp-content/uploads/2013/12/Doctoring-Our-Diet_-September-2019-V2.pdf

Special Article

Driving Transformative Change to End Hunger and Reduce Diet-Related Diseases and Disparities: The White House Conference on Hunger, Nutrition, and Health

Tricia Psota¹, Shelley Maniscalco¹, Michelle Kijek¹, Sarah D. Ohlhorst^{2,*}

¹ Nutrition on Demand, Arlington, VA, USA; ² American Society for Nutrition, Rockville, MD, USA

BOX 3

Selected Actions in the National Strategy for Pillar 2 [2]

- Provide greater access to nutrition services to better prevent, manage, and treat diet-related diseases, by expanding Medicare and Medicaid beneficiaries' access to "food is medicine" interventions, as well as nutrition and obesity counseling.
 - o The Biden-Harris administration supports legislation to create a pilot to test covering medically tailored meals for individuals in traditional Medicare who are experiencing diet-related health conditions; and supports expanding nutrition and obesity counseling to more Medicaid and Medicare beneficiaries.
 - o HHS Centers for Medicare & Medicaid Services will issue guidance on how states can use section 1115 demonstrations to test the expansion of coverage of "food is medicine" interventions.
- Increase access to nutrition-related services through private insurance and federal programs beyond Medicare and Medicaid.
 - o HHS Indian Health Service (IHS) will implement and evaluate a National Produce Prescription Pilot Program.
 - o VA will implement and evaluate various food programs, including produce prescription programs, food pantries, and mobile food pantries that meet local needs and Veteran preferences.
- Screen for food insecurity and connect people to the services they need through universal screening in federal health care systems.
 - o HHS IHS will implement a process to assess for food insecurity in the IHS user community and conduct referrals as needed.
 - o DoD will screen all active-duty military for food insecurity and conduct referrals as needed.
- Incentivize payors and providers to screen for food insecurity and other social determinants of health.
- Strengthen and diversify the nutrition workforce, bolstering the health care workforce (including nutrition professionals) and ensuring that medical professionals comprehensively receive nutrition education.
- Support wellness and nutritional care for children, especially those from low-income families.

Request for Information (RFI): Food is Medicine Research Opportunities

Notice Number:

NOT-OD-23-107

Key Dates

Release Date: April 11, 2023

Response Date: June 30, 2023

Related Announcements

None

Issued by

Office of Nutrition Research ([ONR](#))

Office of AIDS Research ([OAR](#))

National Heart, Lung, and Blood Institute ([NHLBI](#))

National Institute on Aging ([NIA](#))

Eunice Kennedy Shriver National Institute of Child Health and Human Development ([NICHD](#))

National Institute of Dental and Craniofacial Research ([NIDCR](#))

National Institute of Diabetes and Digestive and Kidney Diseases ([NIDDK](#))

National Institute of Mental Health ([NIMH](#))

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Centers for Disease Control and Prevention (CDC), Division of Nutrition, Physical Activity and Obesity ([DNPAO](#))

Centers for Medicare & Medicaid Services, ([CMS](#))

Office of the Assistant Secretary of Health ([OASH](#))

Office of Disease Prevention and Health Promotion ([ODPHP](#))

Health Resources and Services Administration ([HRSA](#))

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U.S. Department of Veterans Affairs ([VA](#))

United States Department of Agriculture ([USDA](#))

Food and Drug Administration ([FDA](#))

Agency for Healthcare Research and Quality ([AHRQ](#))

- Expansion of clinical nutrition training for health professionals, medical school curricula, and nutrition fellowships
- Inclusion of culinary medicine and teaching kitchen programs

<https://grants.nih.gov/grants/guide/notice-files/NOT-OD-23-107.html>

Summary

- Disparity between the content of undergraduate medical education and major causes of preventable death and disability
- Federal and policy-making bodies seem interested in this disparity and have suggested that ACGME funding could be leveraged
- Nutrition scientists should become involved at the local and national levels
 - Respond to ACGME request for competencies
 - Respond to RFI from NIH
 - Engage with elected representatives

