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**Nutrition Resources developed through the Nutrition Academic Award Program for
Medical Schools**

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Abstract

One of the goals of the Nutrition Academic Award (NAA) program is to enhance and integrate nutrition into the medical school curriculum. This goal requires that resources be available for a wide range of nutrition topics and in a variety of formats that can be incorporated into existing courses and clinical clerkships. This paper describes the resources developed by multidisciplinary teams of physicians, nutritionists, and medical school educators through the NAA program, and provides a comprehensive list of educational materials that have been produced over the past five years by 21 U.S. medical schools. These materials include nutrition assessment and counseling tools, knowledge and attitude surveys, nutrition and wellness newsletters, Power Point slides, videos, books, clinical cases, and web-based products. These resources are available through the national NAA Web site at <http://www.nhlbi.nih.gov/funding/training/naa/> Medical institutions and faculty members who are responsible for teaching nutrition in medical schools will find the resources for training medical students and residents in nutrition.

KEY WORDS: medical nutrition education, nutrition resources, web-based nutrition tools

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Introduction

The Nutrition Academic Award (NAA) Program was funded jointly by the National Heart, Lung, and Blood Institute (NHLBI) and the National Institute of Diabetes, and Digestive and Kidney Diseases (NIDDK) with the objectives of enhancing the medical school curricula with nutrition principles and clinical practice skills, and developing a curriculum guide, training modules, and other teaching and assessment tools. The NAA has been described in detail by Pearson, et al (1), Walker (2), and Van Horn (3). Briefly, the 21 medical institutions funded under this program have incorporated nutrition objectives and topics into the four years of undergraduate medical education, and in some cases, in the graduate training programs (4-6). A major goal of the NAA is to disseminate educational materials to other medical schools and to expand the use of new resources so that all medical students and residents develop a level of competency in their nutrition knowledge and clinical skills that allows them to effectively assess and counsel their patients. Although there are similarities among the NAA schools in terms of the pre-clinical and clinical curriculum, each school has unique didactic courses, problem-based learning cases, objective standardized clinical exams (OSCE), electives that are integrated with nutrition topics and educational tools in varied formats that can be incorporated at different levels of medical education and training. Many of the educational resources developed through the NAA are primarily focused on prevention and treatment of cardiovascular disease, obesity, diabetes, hypertension, and other chronic diseases.

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This paper describes the educational resources by the 21 NAA medical institutions.

Curriculum Guidance

A major accomplishment for the NAA investigators was the completion of the *Nutrition Curriculum Guide for Training Physicians* (7). A primary goal of the NAA Curriculum Committee, the Curriculum Guide was developed using the 1995 American Medical Student Association (AMSA) national consensus report which identified 92 content areas as “essential for nutrition education in medical schools” (8) and the priority nutrition topics identified by the American Society for Clinical Nutrition (ASCN) Committee on Medical/Dental School and Residency Nutrition Education (9). Nutrition content areas, organized into 23 topics or chapters, were assigned to each of the 21 NAA schools and teams composed of physicians, nutritionists, and medical educators wrote learning objectives, practice behavior skills, and attitudes. The learning objectives were then prioritized within each content area through a consensus-generating modified Delphi technique to identify those most important nutrition objectives at each level of medical education and training. Upon completion of the Curriculum Guide in 2003, printed copies were sent to the Deans at all 126 U.S. medical schools.

The Curriculum Guide provides an extensive foundation for medical schools to use the nutrition objectives to develop their own nutrition curriculum at an appropriate level for medical students, residents, and physician nutrition specialists. The Table of Contents for the Curriculum Guide is shown in **Table 1**. This resource is available as a

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www.nhlbi.nih.gov/funding/training/naa/guide.htm.

Table 1. Nutrition Curriculum Guide for Training Physicians - Table of Contents

- A. Practice Behavior Skills Across the Curriculum
 - A.1 Practice Behavior Skills Across the Curriculum
 - A.2 Attitudes Across the Curriculum
- B. Overview and Nutrition Basics
 - B.1 Nutrition Principles
 - B.2 Community and Population Health
 - B.3 Behavioral Science Principles
 - B.4 Nutrition Assessment
 - B.5 Physical Activity
- C. Lifespan
 - C.1 Pediatrics
 - C.2 Young Adulthood/Middle Age
 - C.3 Geriatrics
 - C.4 Women’s Health
- D. Cardiovascular System (See also Physical Activity, Obesity, and Diabetes Mellitus)
 - D.1 Hyperlipidemia and Atherosclerosis
 - D.2 Hypertension
 - D.3 Heart Failure and Cardiomyopathy
- E. Metabolic/Endocrine Systems
 - E.1 Obesity
 - E.2 Diabetes Mellitus
- F. Other Organ Systems
 - F.1 Gastrointestinal
 - F.2 Hematology/Oncology
 - F.3 Immunology

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- F.4 Rheumatology
 - F.5 Pulmonary
 - F.6 Renal
 - F.7 Bone

 - G. Other Areas
 - G.1 Nutrition Support
 - G.2 Contemporary Trends
-

Nutrition Assessment Tools

Many resident physicians and clinicians face challenges in counseling patients about nutrition and lifestyle behavioral modifications. Often, they are required to quickly present and evaluate a patient’s health problem and effectively counsel the patient within a short time frame, about 10-15 minutes. Thus, assessment tools that are effective, reliable and can be administered rapidly are needed for counseling patients. Two popular tools for assessing eating habits, diet, and physical activity of patients were developed by physicians and nutrition faculty members at the Albert Einstein College of Medicine and Brown University Medical School. These are the Weight, Activity, Variety, and Excess (WAVE) and Rapid Eating and Assessment for Patients (REAP) which are both appropriate for brief assessments of patients during regular clinic visits (10). Briefly, the WAVE tool is designed to encourage dialogue between the primary care physician and patients about current weight and physical activity status, to evaluate the variety of foods eaten, and identify sources of excess calories and fats. The WAVE Pocket Card is designed to address the assessment component on the front side whereas the reverse side provides recommendations for educating patients. REAP is designed to assess general

dietary issues that are national nutrition priorities for adults including comparison to the

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Note: This manuscript has been submitted for publication in *Medical Education Online*. It has been screened by a Managing Editor but has not been subjected to peer review Food Guide Pyramid, U.S. Dietary Guidelines, and the Healthy People 2010 objectives

for physical activity. A short version of REAP (REAP-S) has been validated through a comparison with the Block 1998 Food Frequency Questionnaire by medical students at Albert Einstein College of Medicine and found to be very useful for measuring intake of fruits and vegetables, whole grains, calcium-rich foods, fat and cholesterol, sodium, sugar-containing beverages, and alcohol (11). These tools are both practical, effective, and can be used in less than 10 minutes.

The University of Wisconsin Medical School (UW) uses nutrition assessment and counseling tools in a Web-based Medical Nutrition Handbook for patients with hypertension, obesity, diabetes, and cardiovascular disease (12). Their tools provide suggestions for a 5-minute counseling or a 15-minute counseling session on each of these clinical topics. The UW Handbook follows the patient intervention model recommended by the U. S. Preventive Services Task Force (13). This model is based on the 5 A’s and includes the following steps: Assess, Advise, Agree, Assist, and Arrange. The assessment tools should be demonstrated to medical students in a preclinical course or at the beginning of their primary care clerkships so that they can incorporate the tools into patient care.

For medical students and residents who work with patients at risk for metabolic syndrome, a pocket tape measure for waist circumference has been developed by the NAA team at the University of Texas Southwestern Medical School at Dallas (14).

Pocket tape measures are used in conjunction with a laminated card that contains reference information on body mass index and waist circumference. The reverse side of

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Note: This manuscript has been submitted for publication in *Medical Education Online*. It has been screened by a Managing Editor but has not been subjected to peer review. The card contains information on food selection and physical activity to assist patients in control of elevated serum lipids, blood pressure, and body weight. These NAA resources are listed in Table 2.

Power Point Slides, Books, Handbooks and Videos

Several of the NAA schools including Brown University, Northwestern University, and the University of Pennsylvania have slides from nutrition lectures available on their Web site. In some cases, lecture outlines are also included for a variety of clinical nutrition topics. These materials should be helpful to schools who have limited faculty resources for developing nutrition content. A textbook, *Medical Nutrition and Disease: A Case-Based Approach*, written by members of the NAA team at the University of Pennsylvania, is a useful reference for faculty, students, and residents. Each chapter in this textbook includes review questions that are extremely beneficial to medical students as they prepare for their national board exams. In addition, the *Nutrition and Preventive Medicine Handbook: a Resource Guide for Medical Professionals* has been developed by the University of Texas Medical School at Houston. This pocket-size handbook, which is periodically updated and made available in PDF format in 2007, includes the evidence-based clinical guidelines for treating patients with cardiovascular disease, obesity, hypertension, diabetes, osteoporosis, and other chronic diseases. A video, “Putting Nutrition into Medical Practice”, developed for clinical training of medical students and residents by the University of Wisconsin Medical

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Note: This manuscript has been submitted for publication in *Medical Education Online*. It has been screened by a Managing Editor but has not been subjected to peer review. School, demonstrates interviewing and counseling skills for patients who are overweight or have risk factors for obesity-related health problems.

Clinical Cases and Standardized Patients

One of the barriers to successful integration of nutrition into medical education and training has been the lack of time in the curriculum for additional courses or lectures. The advantage of teaching nutrition within the context of clinical cases and interactive computer modules is the ability for students to complete the material outside of class time. Many schools use standardized patients for instruction and skills development and to prepare medical students for clinical clerkships by having them practice clinical skills and assess patient risk factors for chronic diseases. Standardized patient scenarios have been developed by the University of Arkansas and by Tufts University, and can be found on the NAA Websites of these schools. Third-year students at Harvard Medical School, for example, use standardized patients to assess and counsel patients on nutrition and lifestyle factors in the prevention and treatment of chest pain.

Problem-based learning strategies and role playing clinical cases are innovative methods to improve clinical competencies. In collaboration with the University of Colorado Medical School, the University of Arkansas addresses pediatric obesity and depression in a lively case-based format; and the College of Physicians and Surgeons, Columbia University Medical Schools uses case studies titled “Is Tony a healthy college student?” to help first year medical students assess their own diet and lifestyle behaviors. A full 32-week series of PBL cases is part of the second year nutrition curriculum at the

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approximately one third contain nutrition content and require students to complete learning issues on some aspect of nutrition in patient care. A review of the problem-based learning approach to incorporating nutrition into the medical curriculum has recently been published by Edwards and Rosenfeld (15).

Table 2. Clinical Resources Developed by Nutrition Academic Award Schools

Type	Audience *	Medical School
Assessment and Counseling Tools		
• Weight, Activity, Variety, and Excess (WAVE)	A, B, C	Albert Einstein, Brown University
• Rapid Eating and Assessment for Patients (REAP)	A	
• Cardiovascular Risk Assessment and Behavioral Counseling	A, B, C	University of Alabama
• Clinical Integration of Nutrition Assessment and Counseling	A3	University of Arkansas
Standardized Patients		
• Nutrition and the Prevention of Coronary Heart Disease	A1	University of Arkansas
• Nutrition Counseling	A2	
• Standardized Patient for Assessment of Nutrition and Counseling Skills in a Patient with Chest Pain	A, C	Harvard Medical School

*A = Medical Students, A1 = First Year, A2 = Second Year, A3 = Third Year, A4 = Fourth Year

B = Residents

C = Nurses, Practitioners, Physicians, Pharmacists, Internal Medicine, Clerkships, Patients and other health professionals

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Table 3. Nutrition Education Resources Developed by the Nutrition Academic Award Schools

Type	Audience	Medical School
PowerPoint, Video, CD ROM		
Nutrition and the Prevention of Coronary Heart Disease	A1	University of Arkansas
Supermarket Tour	A1	
Biochemistry and Preventive Nutrition	A1	
Obesity Epidemic	A2	
Nutrition Counseling	A2	
Pediatric Nutrition Skills	A3	
Nutrition in the Prevention of Cardiovascular Disease, Diabetes, and Hypertension	A, C	Harvard Medical School
Dietary Assessment and Use of Nutrition Intervention for Reducing CVD Risk	C	Tufts University
Hypertension and the DASH Diet	A	
Type 2 Diabetes and Nutrition	A	
Weight Loss Approaches and Critical Issues	A	
Behavioral Skills for Physicians and Patients In Making Lifestyle Changes	A	
Nutrition and Cancer		
Case Study, Interactive Computer Cases		
Adolescent Obesity and Diabetes Prevention	A3	University of Arkansas
“Mr. and Mrs. Marsham” Cardiovascular Nutrition Cases	A4, C	University of Texas Southwestern at Dallas
Is Tony a Healthy College Student?	A1	Columbia University

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Web-based Tools

An interactive Web-based module *Nutrition in Preventive Medicine* was developed at the University of Texas Medical School at Houston to teach basic science nutrition principles as well as more clinically relevant topics including nutrition and disease prevention, nutrition assessment, medical nutrition therapy, and public health policy. This module, also available for Blackboard, is currently used in the first year Introduction to Clinical Medicine course but is appropriate for all four years of the undergraduate curriculum. A complete description of the module was recently published by Edwards and Lasswell (16).

Several of the NAA medical schools have developed Web-based materials particularly Mercer School of Medicine, the University of Wisconsin, and Stanford University School of Medicine. The Web-based resources have been described by Underbakke et al (12) and can be accessed by going to the NAA Home Page at <http://www.nhlbi.nih.gov/naa> .

Discussion

One of the barriers to effective nutrition education in medical schools has been the limited number of resources for training medical students and residents. The resources developed by the NAA have greatly improved the ability of faculty to integrate

nutrition into the curriculum using a variety of modules that cover a wide array of priority

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Note: This manuscript has been submitted for publication in *Medical Education Online*. It has been screened by a Managing Editor but has not been subjected to peer review nutrition topics. With the availability of websites at all of the NAA schools, students are able to access materials for specific topics that are both clinically relevant and evidence-based.

Medical educators work within a unique environment and an established curriculum in their medical schools and are often called on to be creative in their approach to teaching nutrition in a format that simulates the clinical setting. Through the development of innovative tools, clinical case studies, and standardized patients the NAA teams have provided resources that are now available to all medical schools through the national NAA website. The dissemination of these educational resources is critical for the continued enhancement of nutrition in the medical curriculum of U.S. medical schools.

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