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Report VIII

Contemporary Issues in Medicine: The Prevention and Treatment of Overweight and Obesity

Medical School Objectives Project



August 2007

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Overweight and Obesity

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To request additional copies of this publication, please contact:

Rika Maeshiro, M.D., M.P.H.

Association of American Medical Colleges

2450 N Street, NW

Washington, DC 20037

T 202-828-0436 **F** 202-828-0972

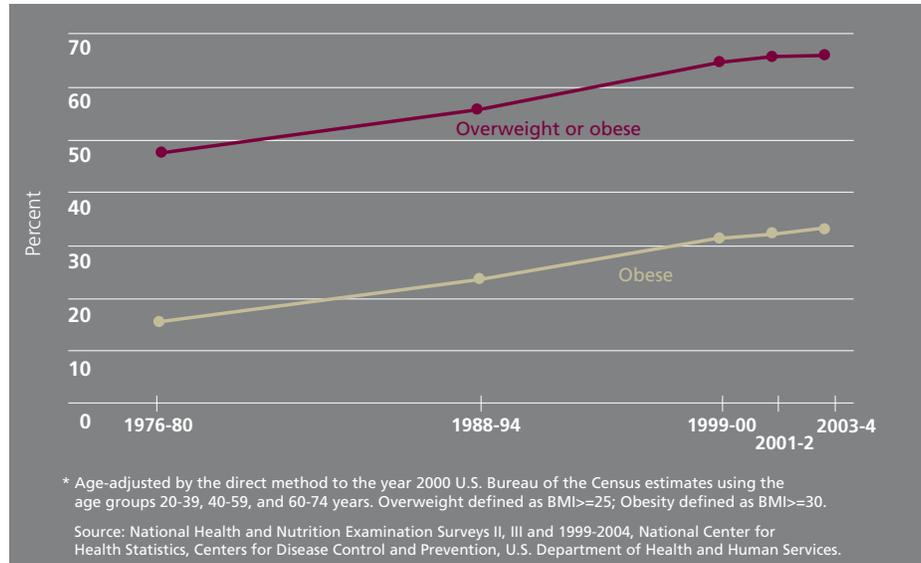
rmaeshiro@aamc.org

Introduction

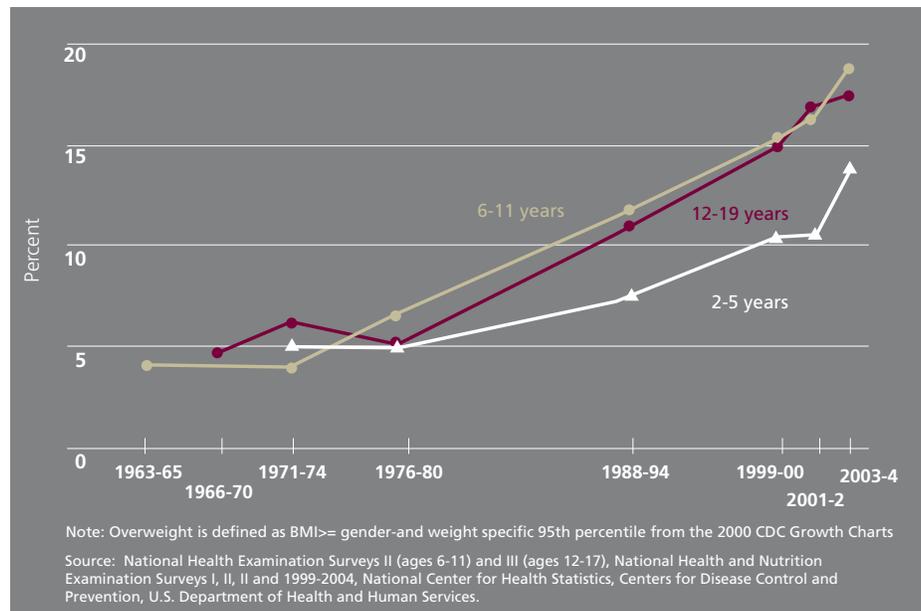
The burden of illness associated with overweight and obesity in the United States and the rest of the world has become an issue of growing concern to the medical and public health communities in the late 20th and early 21st centuries. Data from 2003-2004 revealed that in the United States, almost two-thirds (66.3%) of adults 20 years and over were overweight or obese, an increase of more than 150% since the early 1970s.^{1,2} Prevalence among children and adolescents has doubled in the past 2 decades in the United States. Currently, 18.8% of 6- to 11-year-olds and 17.4% of 12- to 19-year-olds are at or above the 95th percentile of Body Mass Index (BMI) on standard growth charts.¹ From an international perspective, the World Health Organization stated in 2005 that more than 1.6 billion adults (ages 15 years and older) across the globe were overweight, and at least 400 million were obese.³

Chronic disease risk factors and comorbidities associated with overweight and obesity include type 2 diabetes mellitus, gallbladder disease, cardiovascular disease, dyslipidemia, hypertension, stroke, osteoarthritis, sleep apnea and respiratory problems, and certain cancers (breast, colon, endometrium, gallbladder, and kidney).^{4,5,6} Researchers state that obesity was associated with at least 100,000 excess deaths in the United States in 2000,⁷ and that increasing obesity rates are associated with higher rates of disability.⁸ Obese adults pay an estimated additional \$395.00 per year in medical costs compared to normal weight adults.⁹ From a national perspective, overweight- and obesity-

Trends in Adult Overweight and Obesity, ages 20-74 years



Trends in Child and Adolescent Overweight



attributable medical spending accounted for 9.1% of total annual U.S. medical expenditures in 1998 (as high as \$78.5 billion in 1998 dollars, \$92.6 billion in 2002 dollars).¹⁰

The general public, the media, and the public and private sectors are concerned about overweight and obesity. A national survey in 2000 revealed that 46% of women and 33%

of men reported trying to lose weight, but that less than a quarter of them reported consuming fewer calories and following physical activity guidelines.¹¹ In 1995, the Institute of Medicine reported that \$33 billion was spent yearly on weight reduction products, although not by only overweight or obese individuals. In 2003, 15% of food-related media coverage was on obesity/weight management, compared to 5% two years earlier.¹² According to CDC's database, since 2003, all 50 states have considered legislation addressing nutrition and physical activity in efforts to prevent and treat overweight and obesity.¹³

In light of the public health, health care system, and medical implications of overweight/obesity and the tremendous public attention to the topic of weight control, current and future physicians must be better informed about the science of weight regulation and be prepared to work effectively with increasing populations of overweight and obese patients to decrease their health risks. Equally important, they must understand their roles in working with all patients to help prevent unhealthy weight gain. Recognizing this important challenge to medical education, the Association of American Medical Colleges (AAMC) convened an expert panel to develop a Medical School Objectives Project (MSOP) report on the prevention and treatment of overweight and obesity. Thirteen panelists, including leaders from

academia, government agencies, and professional organizations, and a member of the U.S. Preventive Services Task Force, were chosen from the medicine, medical education, and public health communities with expertise in mental health, nutrition, physical activity, and a variety of medical specialties, including bariatric surgery, internal medicine, family medicine, pediatrics, and preventive medicine.

In March 2005 the panelists convened to address two questions:

What should medical students learn about the prevention and treatment of overweight and obesity (learning objectives)?

What kinds of educational experiences would allow students to achieve those learning experiences?

The expert panel approached these questions from individual- and population-based health perspectives, reviewed relevant literature and educational resources, and arrived at the following suggestions for the education of all medical students, not just those who are interested in pursuing medical fields that focus specifically on overweight and obese patients.

Background

Concern regarding the adequacy of nutrition education in medical schools had resulted in a number of initiatives in the 1960s through the early 21st century¹⁴ to enhance this aspect of undergraduate medical education. Because a better appreciation of nutrition is an important cornerstone of understanding the prevention and treatment of obesity, the expert panel included participants in the Nutrition Academic Awards (NAA), a program to improve nutrition education for medical students sponsored by the National Heart, Lung and Blood Institute of the National Institutes of Health (NIH). The NAA's *Nutrition Curriculum Guide for Training Physicians*,¹⁵ along with other contemporary resources on overweight and obesity, including the NIH publication *The Practical Guide to the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*,⁶ and materials submitted by individual panelists¹⁶ were reviewed by the expert panel.

The panel also reviewed the general objectives that had been outlined in the first report of the Medical School Objectives Project, *Learning Objectives for Medical Student Education—Guidelines for Medical Schools*. The general learning objectives from this 1988 report were organized by 4 principles: altruism, knowledge, skill, and dutifulness.¹⁷ The panelists found that many of the learning objectives specific to the topic of overweight/obesity aligned well with the broad learning objectives from this report (Figure 1).

Barriers

Adding new content into the already crowded undergraduate medical curriculum is always a challenge. The panel noted that additional challenges to the successful integration of overweight/obesity content into the medical school curriculum included the attitudes of clinicians, the dearth of evidence supporting effective approaches to treat overweight and obesity in the primary care setting, and health care system barriers to implementing practice approaches that would serve as models for medical students.

Attitudes:

The treatment of overweight and obesity can be difficult and frustrating to patients and their providers. Successful behavior change usually requires comprehensive, longer-term clinical interactions which include thorough assessment and negotiated behavior change or treatment. Multidisciplinary programs have been the most successful in assisting with long-term weight loss. Physicians who do not have the opportunity to practice in, or refer to, a multi-disciplinary system may be less inclined to address these topics with their patients and when interacting with medical students. They may not consider referrals to intensive programs to assist patients with weight control, and they may not appreciate their responsibility to educate patients. Negative stereotypes about overweight and obese patients sometimes may be explicitly or implicitly communicated to medical students.¹⁸

Figure 1.

General learning objectives from MSOP Report 1 that are consistent with specific learning objectives for overweight/obesity

Physicians must be knowledgeable:

- Knowledge of the molecular, biochemical and cellular mechanisms that are important in maintaining the body's homeostasis.
- Knowledge of the altered structure and function (pathology and pathophysiology) of the body and its major organ systems that are seen in various diseases and conditions.

Physicians must be altruistic:

- Compassionate treatment of patients, and respect for their privacy and dignity.
- An understanding of, and respect for, the roles of other health care professionals, and of the need to collaborate with others in caring for individual patients and in promoting the health of defined populations.
- The capacity to recognize and accept limitations in one's knowledge and clinical skills, and a commitment to continuously improve one's knowledge and ability.

Physicians must be skillful:

- The ability to obtain an accurate medical history that covers all essential aspects of the history, including issues related to age, gender, and socioeconomic status.
- The ability to interpret the results of commonly used diagnostic procedures.
- The ability to construct appropriate management strategies (both diagnostic and therapeutic) for patients with common conditions, both acute and chronic, including medical, psychiatric, and surgical conditions, and those requiring short- and long- term rehabilitation.

Physicians must be dutiful:

- Knowledge of the important non-biological determinants of poor health and of the economic, psychological, social, and cultural factors that contribute to the development and/or continuation of maladies.
- Knowledge of the epidemiology of common maladies within a defined population, and the systematic approaches useful in reducing the incidence and prevalence of those maladies.
- The ability to identify factors that place individuals at risk for disease or injury, to select appropriate tests for detecting patients at risk for specific diseases or in the early stage of disease, and to determine strategies for responding appropriately.

Evidence:

Preventing and treating overweight and obesity in clinical settings are evolving fields. The U.S. Preventive Services Task Force found sufficient evidence to recommend screening all adult patients for obesity; offering obese patients intensive counseling and behavioral interventions to promote sustained weight loss;¹⁹ and offering adult patients with risk factors for other chronic diseases medium- to high-intensity dietary counseling.²⁰ Less evidence exists currently to support recommendations for other population groups. The Task Force found insufficient evidence²¹ to recommend for or against counseling interventions to promote healthy diets¹⁹ or physical activity²² in the general population, and insufficient evidence for the effectiveness of screening, behavioral counseling, or other preventive interventions with overweight children and adolescents that can be conducted in primary care settings.²³ The long-term outcomes and effects of surgical and pharmacologic interventions are also topics of on-going study. Despite the recognition that maintaining weight loss requires long-term behavioral changes in diet and high levels of physical activity, long-term outcome data for successful clinical approaches to support such changes are limited. With these uncertainties, medical school faculty may be less inclined to incorporate the complexities of weight management into the curricula, despite the magnitude of the health problem.

Healthcare systems:

Multi-disciplinary, intensive approaches to the prevention and treatment of overweight and obesity are more likely to be effective, but many medical practices may not function within systems that support these approaches or provide models for students to follow. With growing demands on physicians' time, many are unable to provide the intense counseling that is most effective. Access to a referral network that includes specialists in obesity/overweight treatment (including health professionals other than physicians) is critical. Healthcare systems may not place an appropriate emphasis on the value of primary prevention to help patients maintain a healthy weight before becoming overweight. Reimbursement policies may not compensate physicians for their preventive efforts nor for their time devoted to overweight and obesity management. Finally, the relative lack of emphasis on public health in academic medical centers does not facilitate physician awareness of effective population-level interventions.

Despite these barriers, the panel strongly affirmed the critical need to integrate overweight and obesity instructional themes into the medical school curriculum.

Curriculum Content

Guiding Principles

Through the panel's deliberations, the following overarching themes were identified:

- *The universal importance of weight management, including the prevention of overweight and obesity, should be emphasized in the medical school curriculum:* Physicians should help all patients understand that weight management, through proper nutrition and physical activity, is a health issue that affects everyone. Educational efforts to encourage the prevention of overweight and obesity are vital.
- *Medical education should not contribute to the stigmatization of overweight and obese patients:* To provide compassionate and effective care, future physicians must be trained to be sensitive to the ostracism experienced by many overweight and obese patients.
- *The current uncertainties regarding some aspects of preventing and treating overweight and obesity should not prevent future physicians from learning about overweight and obesity:* Educators are responsible for imparting the knowledge, skills, and the appropriate attitudes to future physicians so that they can critically assess breakthroughs in the field and address overweight and obesity more effectively in their practices.

- *The ideal setting to treat patients who are overweight or obese includes social support and behavioral treatment with a multidisciplinary team:* A multi-professional, intensive approach to treating overweight or obese patients, including access to experts as needed in medicine, nutrition, physical activity, psychology, and surgery, is effective.
- *Physicians must better appreciate and support population-based efforts to prevent and control overweight and obesity:* Many of the actions that will help correct the problem of overweight and obesity will take place outside of the clinical setting, but will be important interventions for physicians to support.

The panel's learning objectives for the prevention and treatment of overweight and obesity are presented below, divided into the traditional divisions of basic science and clinical content along with population health, an area receiving increasing attention in medical education.

Basic science

Researchers are continuing to understand more about the mechanisms underlying the development of overweight and obesity, and the impact of excess weight throughout the body. The fields of molecular genetics and neurochemistry have helped to explain the hormonal and neurochemical mechanisms responsible for the energy imbalance that generates obesity. Future insights into the genetic basis of differences in the hormones and neurotransmitters responsible for

regulating satiety, hunger, lipogenesis, and lipolysis will refine understanding of the risks for overweight and obesity, and may lead to more effective therapies. The basic science curriculum offers many opportunities to incorporate these recent breakthroughs when teaching biochemistry, genetics, metabolism, pharmacology and physiology.

For its part, the medical school must ensure that before graduation a student will have demonstrated, to the satisfaction of the faculty, the following:

- Basic knowledge of the expression of obesity phenotypes, by understanding the interaction of genes and the environment.
- Basic knowledge of the physiologic aspects of diet and hunger.
- Knowledge of the physiologic aspects of physical activity and energy consumption.
- Knowledge of the basic principles of nutrition, including an understanding of calories and the calorie content of carbohydrates, proteins, fats, and alcohol.
- Basic knowledge of physical activity, including:
 - The beneficial effects of physical activity and the detrimental effects of inactivity on the cardiovascular, musculoskeletal, pulmonary, and neurological systems.
 - The relative contribution of basal and resting metabolism, dietary thermogenic influences, and

physical activity to the total daily energy expenditure (TDEE).¹⁵

- Understanding that weight management (weight gain, loss, and maintenance) is based on the balance between nutrition (energy intake) and physical activity (energy expenditure).
- Knowledge of the metabolic, genetic, physical, and physiologic factors that contribute to overweight and obesity, including the role of the neuro-endocrine system.
- Knowledge of the metabolic and immunologic consequences of overweight and obesity.
- Knowledge of the mechanisms underlying the pharmacological approaches to treating overweight and obesity.
- Knowledge of the mechanisms for weight loss and potential long-term consequences associated with surgical treatments for obesity.

Clinical Sciences

During clinical training, a respectful, sensitive, and informed approach to overweight and obese patients should be emphasized, along with skills to assess the weight status of all patients. Because evidence is insufficient currently to support the effectiveness of behavioral counseling in a primary care setting to promote healthy diets or physical activity in the general patient population (i.e., patients who are not identified as "higher-risk"), panelists had different perspectives on the value of training medical students to provide brief counseling interventions, particu-

larly in the absence of an accompanying multi-disciplinary, multi-component approach to support the counseling. All panelists did agree that physicians were in a position to influence the concerns and priorities of their patients, and that they were responsible for educating their patients about the influence of weight on their health and the importance of physical activity and proper nutrition. The panel believed that physicians had a “crucial” role in addressing overweight and obesity issues, but acknowledged that specialized and intensive educational and counseling services may be delivered by others, particularly when treating patients who are trying to lose substantial weight. With the evolution of surgical interventions and the increasing numbers of patients who are opting for surgery to control obesity, the panel believed that all future physicians should be familiar with the general clinical implications of bariatric surgery. Future physicians would also be expected to keep abreast of developing pharmacologic interventions. Panelists advocated for a “coherent” clinical curriculum that legitimizes the importance of the overweight/obesity problem and its many comorbidities and reinforces the appropriate knowledge, skills, and attitudes longitudinally.

For its part, the medical school must ensure that before graduation a student will have demonstrated, to the satisfaction of the faculty, the following:

- The ability to assess all patients for overweight/obesity, including:
 - Calculation of and categorization of Body Mass Index (BMI).
- Measurement and categorization of waist circumference.
- The ability to assess risk for future overweight or obesity through a medical history, including:
 - Family history.
 - Social history, including nutrition and physical activity (work and leisure).
- An appreciation of the importance of preventing excessive weight gain in patients of all ages and weights.
- The ability to address weight even if it is not the primary reason for the patient encounter by addressing weight control as a part of health promotion.
- The ability to recommend simple strategies to increase physical activity in daily routines, including how to overcome common barriers.
- An appreciation for the behavioral, emotional, cultural, and family/household influences that may impact food consumption and the treatment of overweight and obesity.
- An understanding of the role of overeating and portion size control in unhealthy weight gain.
- The difference between moderate and vigorous physical activity and the classification of various physical activities by their energy expenditure rates.
- An understanding of the effects of inactivity in promoting unhealthy weight gain.
- An understanding of the role of physical activity in preventing overweight and obesity.
- The ability to consider the differential diagnosis (secondary causes) of patients who are overweight or obese.
- An understanding of the comorbidities associated with overweight and obesity.
- An understanding of evidence-based algorithms for the care of overweight children and overweight or obese adult and geriatric patients, and the ability to consider the guidance of reputable expert panels when evidence-based algorithms do not exist.
- An understanding that a 5-10% weight loss can improve health risks and that some patients will regain some of their lost weight.²⁴
- The ability to provide understandable information to patients and families with overweight and obesity in a sensitive and respectful manner, including to patients with limited health literacy.
- An understanding of potential barriers to patients’ weight loss and maintenance and possible approaches to addressing these barriers.
- The ability to discuss comorbidities associated with overweight and obesity with patients.
- The ability to determine patients’ readiness to change behaviors.
- The ability to encourage patient input, listen carefully and to

negotiate a mutually agreeable plan for behavior change.

- An understanding of how to help patients make behavioral changes.
- An understanding of the importance of physical activity to maintain weight loss and to decrease comorbidities associated with overweight and obesity.
- An understanding of how self-management skills must be imparted to patients in order to maintain weight loss.
- An appreciation for the important impact of family in addressing overweight and obesity, and the potential of families and groups to provide social support to facilitate weight loss and maintenance.
- The ability to guide patients to sources of credible information and assistance regarding overweight and obesity.
- The ability to provide or to refer all obese adult patients for intensive counseling and behavioral interventions to promote sustained weight loss.
- An awareness of the benefits and risks associated with pharmacological and surgical interventions in obesity treatment, and of the need to stay abreast of future developments regarding these treatment options.
- The ability to monitor patient efforts to achieve or maintain a healthy weight.

Population health sciences

The prevention and control of overweight and obesity are another context in which future physicians should appreciate the potential synergies between individual, clinically-based health care interventions and broader, population-health based interventions. The panelists identified the Accreditation Council for Graduation Medical Education's "systems-based practice" competency as a context in which the systems- and population-basis for the prevention and treatment of overweight and obesity could be promoted.

For its part the medical school must ensure that before graduation a student will have demonstrated, to the satisfaction of the faculty, the following:

- An understanding of the epidemiology of overweight and obesity, including associated risk factors and health disparities across populations.
- An understanding of the social and physical environmental determinants (including the built environment) that may contribute to decreased physical activity, overweight and obesity.
- An understanding of current U.S. dietary and physical activity guidelines.
- An understanding of the kinds of public policies that might affect the incidence and prevalence of overweight and obesity.

- Recognition of evidence-based, community interventions that have been shown to be effective in promoting physical activity and controlling overweight and obesity.
- The ability to identify the characteristics of health systems that will facilitate the prevention, identification, and treatment of overweight and obesity.
- An understanding of potential disparities in access to healthy foods or to safe recreational activities that can influence a community's risk for overweight and obesity.
- An appreciation that reducing the prevalence of overweight and obesity cannot be accomplished solely in the clinical setting and that community partnerships must be created to address this issue
- An understanding of the limits of our current understanding of the health effects of overweight and obesity and the uncertainties associated with our current treatments.
- The ability to examine future health research on this issue to look for ways to improve our understanding of causal risks and effective treatments.
- An understanding of the relationships among the basic, clinical, and population health science aspects of overweight and obesity.

Learning Opportunities

General principles

Overweight and obesity-related learning objectives should be integrated vertically and horizontally in all four years of medical school.

Panelists agreed that curricular content should be integrated into the basic, clinical, and population health sciences across all four years of medical school education. Overweight and obesity can be integrated readily into basic sciences studies in anatomy, biochemistry, cell biology, immunology, and physiology. Because the prevention, treatment, or effects of overweight and obesity are relevant to all clinical specialties, ranging from primary care (internal medicine, family medicine, obstetrics and gynecology, and pediatrics) to surgical specialties and psychiatry, all clinical clerkships should devote some attention to these topics.

A combination of didactic and interactive instructional methods should be employed.

Panelists agreed that teaching methods should be appropriate for the information to be learned and for the stage of the learner. Early content may be presented in didactic sessions, but interactive activities, including problem-based approaches to apply this and more sophisticated information should also be provided, particularly to provide students opportunities to exercise their knowledge, skills, and attitudes in clinical settings.

Because the prevention and treatment of overweight and obesity continue to be evolving fields, a commitment to

critical appraisal and lifelong learning should be fostered.

New insights into the mechanisms, prevention, and treatment of overweight and obesity are published regularly in the medical literature. Medical students should be prepared to continue to follow the relevant breakthroughs in their chosen specialty, and should also critically assess the quality of the evidence supporting the new findings.

Educational strategies

The panelists endorsed a variety of teaching and learning strategies to meet the needs and level of the learners. They recommended a flexible approach to the teaching of overweight and obesity-related topics, including self-teaching opportunities that are reinforced through the curriculum. Panelists also encouraged schools to provide interactive learning opportunities when possible.

Educational strategies to help students master curricular content related to overweight and obesity include:

- Lectures
- Directed reading
- Review and discussion of case studies
- Use of standardized patients
- Use of online/web-technologies
- Self-directed learning
- Use of empathy suits
- Preceptorships with dietitians/nutritionists
- Problem-based learning examples

that highlight the relevance of biochemistry, nutrition, and other courses to overweight and obesity

- Projects which include diet and physical activity analyses
- Work with patients on weight issues during clerkships with role modeling provided by physician preceptors
- Experiences in clinics that specialize in overweight and obesity
- Experiences in public health departments to learn about population-based approaches to overweight and obesity

Implementation strategies

Panelists considered the challenges to implementing effective curricula in overweight and obesity. They saw an important need to make medical school deans and other stakeholders (faculty, students, and others) aware of the magnitude of the overweight and obesity crisis, and the need to improve medical education in the area. The panelists concurred that in order to provide the best models for physician behavior to help prevent and to treat overweight and obesity, the health care system itself would need to undergo a paradigm shift in which prevention was prioritized and in which inter-professional collaboration was valued and fostered.

Resource development

Panelists identified the need for curricular resources and resources to facilitate linkages with community stakeholders:

- Medical school faculty need ready access to curricular resources that are current, reliable, and tailored to medical students. The panelists felt that medical schools would benefit from resources to fund the development, dissemination, and implementation of effective curricula. A catalogue of critically appraised educational resources was also thought to be of value.
- Medical school faculty need opportunities and incentives to create respectful and productive relationships with the community in order to better understand the importance of population based approaches to overweight and obesity. Through these relationships, faculty may be able to provide valuable experiential learning opportunities for their students.

Faculty development

Like other cross-cutting subjects that cannot be housed in a single basic science or clinical department, developing faculty expertise in overweight and obesity topics for the purposes of medical student education can be challenging. While medical schools may have researchers and clinicians with expertise in specific aspects of overweight and obesity, they may not be prepared to present general information on the topics that would be most relevant to medical students. To this end, the panelists recommended that medical schools consider establishing incentives and rewards to encourage excellence in teaching in this area. Panelists also acknowledged that resident physicians are frequently the role models and teachers for students so that attention to graduate medical education was also needed. Other activities that would promote faculty development in overweight and obesity include:

- Developing evidence-based continuing education opportunities for current faculty to better understand how overweight and obesity impacts their practices and how to better manage this problem with their patient population.
- Identifying overweight and obesity experts and “champions” within medical schools to encourage networking across schools.
- Establishing and evaluating formal programs in faculty development and scholarship in overweight and obesity, as has been done previously in the field of substance abuse.

Evaluation activities

Student competency in overweight and obesity prevention and treatment can be measured through existing systems, but the panelists also recommend that medical students be given an opportunity for self assessment to gauge the appropriateness of their attitudes and behaviors with regard to the evidence-based prevention and treatment of overweight and obesity. More traditional methods of evaluation include written examinations and clinical skills examinations. The expert panel also suggested that overweight and obesity-associated questions should also be included in the United States Medical Licensing Examination (USMLE).

Conclusion

The United States and much of the world are experiencing an epidemic of overweight and obesity. The epidemic appears to be driven mostly by an increase in caloric consumption and a decrease in physical activity, facilitated by societal and other environmental changes. Further research is needed to clarify the etiologies of overweight and obesity, and to identify and to develop effective clinical interventions to prevent and treat overweight/obesity. Additional efforts are needed to implement evidence-based population approaches to controlling overweight and obesity.

Medical education must assure that future physicians will be better prepared to provide respectful, effective care of overweight and obese patients and to appropriately participate in overweight/obesity prevention efforts. Education on assessing, preventing and treating overweight and obesity should be included in basic sciences, clinical experiences, and population health sciences.

Examples of Innovation

Several schools have responded to the growing public health challenge by incorporating overweight and obesity throughout their curricula. While not a comprehensive list, these schools have developed innovative and effective approaches to teaching these topics and may serve as models for other schools:

Medical College of Wisconsin (MCW)

Obesity is a recognized and well documented health care priority for Wisconsin. At MCW, limited clerkship coordination and collaboration have contributed to educational gaps about obesity. A collaborative curriculum on obesity (CoCO) across three partnering clerkships (family medicine, general internal medicine and pediatrics) will: 1) advance the competence of medical students, including knowledge and care of obesity, 2) improve MCW's coordination of 3rd year ambulatory clerkships to foster obesity education quality, and 3) raise volunteer preceptors' knowledge and satisfaction with obesity teaching. CoCO is supported by a state-wide *Advancing Healthier Wisconsin* grant.

This three-year project began in early 2006 with formation of a Steering Committee that includes students and community preceptors. In CoCO's first year, an on-line module was developed and implemented as part of third year MCW students' "Transition to Clerkship" course. This web-based module focused on the case of a middle-aged, female outpatient with joint pain and concerns about her weight, and who has a positive family history of obesity. The module emphasizes epidemiology, assessment and interviewing skills, and it includes a pre-test, tutorials, and post-test. Results showed that students possessed and could appropriately apply important information about comorbidities associated with overweight and obesity. The

post-test also showed that students improved their communication approaches to addressing overweight and obesity after exposure to the tutorials. A chronic disease/obesity website is being developed to house CoCO curricular material as well as an obesity toolkit for physicians and students.

An emphasis of CoCO is the clustering of specific obesity objectives and themes (e.g., diet and activity, metabolic syndrome, communicating for lifestyle change) within each of the three clerkships. The clusters are unique to each of the three clerkships. During family medicine, communication and interviewing skills are emphasized. During internal medicine, metabolic syndrome and treatment options—including pharmacotherapy and surgery—are emphasized. In pediatrics, diet, activity and family history are the focus. These clusters allow students to receive in-depth exposure to these issues efficiently rather than superficial introductions during each clerkship. Clusters will include practical "tools," for use with patients and students; teaching methods; and evaluation strategies, all piloted in year two of the project. A CME Conference will be held near the end of year two for preceptors to introduce innovative "obesity toolkits" that contain updated guidelines, nutritional aids, activity guides, motivational interviewing templates, tape measures and other practical and evidence-based tools specifically useful to each specialty. Obesity toolkits will become the focus of medical students' "service learning" projects at community sites where obesity skill application is emphasized for both patients and providers.

Evaluation will show how CoCO has influenced medical education and Wisconsin's health. Student and preceptor reaction to CoCO will be used to improve curriculum planning. Increased student competence will be demonstrated via OSCEs, patient

satisfaction, and toolkit use, leading to improved care quality for obese patients and at-risk families. As of early 2007, four peer-reviewed presentations about CoCO have been made or accepted at professional meetings, and CoCO has been the focal topic in a regional medical education newsletter. CoCO collaborators will continue to disseminate project results across their specialties and in medical education.

Contact:

Jeffrey A. Morzinski, Ph.D.
Associate Professor, Family and
Community Medicine
Director, Professional Development
Division
Chair, CoCO Advisory Council
Medical College of Wisconsin
jmorzins@mcw.edu

The Warren Alpert Medical School of Brown University

At Brown, obesity/overweight/nutrition topics were previously part of a 22-hour nutrition course that students received in the second year. There is no longer a separate course. Instead nutrition, including topics related to obesity/overweight, is incorporated as a theme throughout the curriculum. A Nutrition Theme Committee meets twice a year to discuss where and how nutrition and obesity/overweight topics are woven into the curriculum.

In the first year, nutrition and overweight/obesity-related topics are taught along with biochemistry. In the second year, as part of the year-long Pathophysiology course, nutrition and obesity topics are incorporated in several ways. In the first semester, a series of five lectures (Macronutrients, Micronutrients and Other Dietary Components, Energy Balance, Nutrition Assessment, and Popular Diets) are incorporated into the curriculum over four weeks, with a

separate exam on these topics at the end. In the second semester, the teaching is more case-based with lectures and corresponding small groups. Nutrition is incorporated into the Endocrinology, Gastroenterology and Human Reproduction sections. For example, in the four-week Endocrinology section, four lectures address obesity: Obesity Pathophysiology, Obesity Assessment and Management, Lifestyle Management of Obesity, and Medical/Surgical Treatment of Obesity. Following these lectures, students break into small groups for case-based discussions that are student-led and jointly facilitated by a team of physicians and dietitians.

Teaching about nutrition and obesity/overweight is also incorporated into several of the clerkships in the third and fourth clinical years including Medicine, Pediatrics, Surgery and Family Medicine. For example, the six-week required clerkship in Family Medicine addresses nutritional issues surrounding obesity and cardiovascular disease (CVD) prevention in several ways. The students spend 20% of their time in didactic experiences, including a series of paper-cases discussed in small group settings and a series of skills workshops. One of the cases addresses an adult male with a history of peripheral vascular disease who has poorly controlled hypertension, hyperlipidemia and obesity (BMI = 30). Readings associated with this case include a chapter from a family medicine text book on *Weight Management and Nutrition*, and the executive summary of the ATP III guidelines (which covers therapeutic lifestyle changes for LDL-lowering). One of the discussion questions for the small group session addresses “how to educate and empower the patient” to follow a healthy diet. This case is paired with a three-hour workshop on CVD risk factors. Approximately 20 minutes of the workshop are devoted to specific dietary counseling for LDL-lowering and for

obesity. These sessions incorporate use of brief assessment tools such as Rate Your Plate, REAP and WAVE (tools and related publications available from Dr. Gans).

The remaining 80% of the student’s time in the Family Medicine Clerkship is spent seeing patients with a family physician in the community. While ambulatory teaching is less structured, we know from the students’ PDA-based patient encounter logs that 16% of encounters are adult full physicals, 10.5% address hypertension, 4.5% address diabetes, and 4.5% address hyperlipidemia. Thus, in at least one-third of their patient encounters, weight management and diet should be discussed. In addition, when medical students and family medicine residents see patients in the Family Medicine Clinic who are obese or need dietary counseling for other reasons, they work jointly with a physician and dietitian preceptor to assess and treat these patients.

Contact:

Kim Gans, Ph.D., M.P.H., L.D.N.
Associate Professor (Research), Community Health
Deputy Director, Institute for Community Health Promotion
The Warren Alpert Medical School of Brown University
kim_gans@Brown.edu

University of Colorado School of Medicine

The Cultural Competence and Diversity Thread (CCDT) is a four year curriculum, integrated into basic courses and clinical internships. As part of the Digestive, Endocrinology and Metabolic Systems (DEMS) Block and the CCDT curriculum an integrated session was developed by the directors of both groups. This integrated session presented health disparities in obesity/overweight within the context of social determinants of health. Medical students were exposed to obesity and overweight risk factors from a perspective

not traditionally included in the medical curriculum. The session included:

- 1) Presentation of health disparities data on life style risk factors (physical activity, smoking, and healthy weight & obesity) for chronic conditions approached in the DEMS block (e.g., diabetes);
- 2) Exploration of the relationship between overweight/obesity and lower socio-economic status (SES) and education using the social determinants of health framework, including:

- Why are racial /ethnic minorities more likely to have unhealthy diets?
 - Current Population Survey Food Security data;
 - Energy density (ED) and food cost data, illustrating the comparative ED/cost ratio of food more likely to be in the racial/ethnic minorities’ regular diet
 - Practical example: “Real Cost of a Healthy Diet,” a community-based food security project at the Boston Medical Center (http://dcc2.bumc.bu.edu/csnap-public/HealthyDiet_Aug2005.pdf), which provides comparative data on: 1) costs of the USDA Thrifty Food Plan (TFP) versus a very realistic healthier diet version of the TFP; 2) availability of food items at different types of stores and neighborhoods for the TFP vs. the Healthy Diet; and 3) average nutrition assistance programs (food stamps, school breakfast, school lunch) compared to the actual food costs.
- Why are racial/ethnic minorities less likely to be physically active?
 - Reduced access to physical activity facilities, including school playgrounds and other public facilities

- Racial/ethnic minorities are more likely to be exposed to “obesogenic” environments: neighborhood social and physical disorder, lack of safety

3) Interactive presentation of physician roles and responsibilities from a public health/population health perspective:

- The health inequalities iceberg concept: life exposures/stresses at the bottom, and access to care/quality of care at the tip of the iceberg
- Graham’s 2004 social determinants of health and Farmer’s 2006 structural violence frameworks
- The failure of purely medical interventions without structural interventions in prevention of chronic conditions such as overweight and obesity
- Examples of structural interventions initiated by health care providers (Freeman’s Navigators and Sauaia et al.’s Promotoras) and how they are part of the physicians’ job

Contact:

Angela Sauaia, M.D., Ph.D.
Associate Professor of Medicine and Preventive Medicine
Director of the Cultural Competence and Diversity Thread
University of Colorado
School of Medicine
angela.sauaia@uchsc.edu

University of Nevada School of Medicine

Program Goals. The nutrition education and research program was restructured in 2003 to become the Division of Medical Nutrition, Department of Internal Medicine. The program received a Nutrition Academic Award that facilitated many of the enhancements outlined below. While the current program provides comprehensive clinical services and translational research opportunities,

an additional focus has been educating medical students, residents, and other health professionals in training. A major priority is obesity and weight management.

Program Structure. The medical education model emphasizes integration within existing basic and clinical courses. For example, nutrition content was added to basic and clinical problem sets during the first two years and to clinical case problems in year three. In addition, a twenty hour nutrition course is required of all students. Students may also opt to receive a “Special Qualifications In Nutrition (SQIN)” by pursuing a four-year sequence of educational experiences. Students and residents also learn about obesity and weight management during fourth year medical electives, and resident clinics in primary care internal and family medicine.

An interdisciplinary team, including physicians, nutritionists/registered dietitians, exercise physiologists, and behavioral health specialists provide faculty to deliver clinical and educational training. The core of the program emphasizes empowering and supporting patients to become more aware of what they are consuming, the need to exercise, ways to increase their daily physical activity and to move their bodies regularly, and to develop a healthy life style and stress management strategies. The major components of the curriculum include:

- Students complete nutritional self assessment assignments in the first semester of Introduction to Patient Care course. This includes opportunities for personalized consultations and measurements (metabolism, body composition).
- A 20-hour Medical Nutrition Course with lectures and Web-based instruction emphasizing the development of problem solving and clinical

skills in nutrition assessment and treatment of common chronic diseases.

- A Special Qualifications in Nutrition (SQIN) track in which medical students (as well as other health professionals in training) are required to devote 40 or more hours per year toward specialized training in nutrition that is integrated into their medical school education. This individualized training incorporates longitudinal clinical training as well as educational and translational research projects that students present at national meetings. Medical students received special recognition upon graduation.
- Nutritional curricular enhancements throughout the general medical curriculum in basic and clinical courses, case-based and clinical problem solving interdisciplinary courses, and specialized clinical and research training electives.

Additional information is available at www.unr.edu/med/dept/mednutrition/

Program Outcomes. In addition to providing nutrition education to all medical students, since 1996, the program has:

- Engaged 26 medical students in SQIN
- Graduated 19 students from 7 classes
- Resulted in 18 trainees funded by NIH Grants (NAA, R01s); 9 trainees funded by the Reno Cancer Foundation, 1 funded through a Pathology Grant
- Development of collaborative Geriatric Interdisciplinary Summer Internship (GISI)-SQIN program
- Fostered 4 award-winning presentations at national meeting; and the submission of 11 abstracts, 6 manuscripts, and 2 related grants
- Expanded to include training for medical residents

Contact:
Sachiko St. Jeor, Ph.D., R.D.
Professor and Chief, Division of Medical
Nutrition
Department of Internal Medicine
University of Nevada School of Medicine
sstjeor@medicine.nevada.unr

University of Pittsburgh School of Medicine

The University of Pittsburgh School of Medicine integrates obesity and nutrition as a longitudinal curricular theme to help address the obesity epidemic.

In basic science courses, overweight and obesity content is introduced in the context of other coursework, particularly where its impact as a co-morbid condition helps students gain perspective on the impact of obesity on health.

In the Behavior, Illness and Society course taught during the later half of the first year, the curriculum includes several sessions on overweight and obesity. In an interactive lecture, students learn about the epidemiology and consequences of childhood obesity. During this session, they are encouraged to think about solutions for individual patients and for populations, including changes in public policy. Subsequent course sessions address behavioral aspects of diet and nutrition; psychosocial, behavioral, and therapeutic issues in obesity; fad diets; and surgical treatments. The timing of this curricular content is ideal for raising student awareness of the pervasiveness of this problem, as they begin to develop their own perspectives on clinical medicine. In this course, students also have an early exposure to the theory of and practical approaches to counseling for behavior change.

The obesity theme is then contextualized in the clinical curriculum. Students receive more in-depth training on how to

encourage behavior change effectively in their patients during the Combined Ambulatory Medicine and Pediatrics Clerkship. Students have opportunities to practice counseling techniques with standardized patients while in the midst of a clinical rotation where they can immediately apply what they have learned.

During the Combined Ambulatory Medicine and Pediatrics Clerkship, one-third of third-year students spend a week in the Weight Management and Wellness Center at Children's Hospital, in a course segment on Preventive Cardiology and Pediatric Obesity. Students evaluate new patients for behavioral factors that contribute to obesity. They also identify and treat obesity-related illnesses in this pediatric population. This unique experience gives students the skills to recognize obesity and its consequences, and to execute practical strategies for weight loss in children. Another fraction of the class rotates on the bariatric surgery service each month as part of the third year surgery clerkship.

The importance of this topic is reinforced in all four years by including obesity counseling and therapy as explicit items in experience logs submitted during the first and second year Clinical Experience Courses, and in the clinical clerkships.

Contact:
Goutham Rao, M.D.
Associate Professor, Pediatrics
Clinical Director, Weight Management and
Wellness Center
University of Pittsburgh School of
Medicine
goutham.rao@chp.edu

University of Texas Medical School at Houston

The University of Texas Medical School at Houston incorporates information and skills relevant to the prevention and

treatment of overweight and obesity throughout its curriculum. Students also have opportunities to work with adult and pediatric patients who are overweight or obese in several clinical settings.

Body Mass Index (BMI) is introduced in Biochemistry within the context of energy balance and energy requirements. To reinforce this didactic material, a Web-based module *Nutrition in Preventive Medicine* is a required component in Introduction to Clinical Medicine. The module allows students to work with an interactive BMI calculator and to review obesity as a chronic disease. The Clinical Nutrition Elective, a lecture series for first and second year students in the spring semester, provides a one-hour lecture on treatment of obesity including diet and lifestyle, pharmacologic, and surgical approaches. A Problem Based Learning case in second year presents a morbidly obese patient with sleep apnea who undergoes bariatric surgery. The Pediatric Clerkship in third year provides students an opportunity to work with overweight childhood and adolescents. In the fourth year, a clinical nutrition elective is offered in the Department of Internal Medicine which focuses on prevention and treatment of obesity, diabetes, and cardiovascular disease. This popular elective provides students the opportunity to rotate through the Wellness Center and the Diabetes and Cardiovascular Out-Patient Centers at Memorial Hermann Hospital, the primary teaching hospital for the University of Texas Medical School at Houston.

Contact:
Marilyn Edwards, Ph.D., R.D.
Associate Professor
Division of Gastroenterology, Hepatology,
and Nutrition
Department of General Internal Medicine
University of Texas Medical School at
Houston
marilyn.s.edwards@uth.tmc.edu

University of Wisconsin School of Medicine and Public Health

The University of Wisconsin School of Medicine and Public Health uses an integrated curricular approach to the important topics of obesity and obesity prevention. Students learn about these issues beginning in the basic sciences courses of physiological chemistry, genetics, population health, and in the second year Clinical Nutrition course. Nutrition curriculum expansion had been facilitated by a NHLBI Nutrition Academic Award from 2000 to 2005. Students participate in small group, problem-based learning on clinical examples of these problems, and also complete self-assessments on nutrition and physical activity. Specific skills are developed in nutrition and obesity evaluations in the Patient, Doctor and Society course in the first and second year.

Students also have opportunities to do research in pediatric and adult obesity during the summer after the first year of school. Additional teaching and experience is provided in the curriculum in several clinical clerkships, including primary care, pediatrics, internal medicine, and surgery. Specific lectures and projects are provided to students during their 3rd and 4th year rotations on the topics of overweight, metabolic syndrome, obesity and nutrition/lifestyle change. For example, students are fed a lunch which meets the recommendations of national guidelines on nutrition during the orientation to the 3rd medicine clerkship. During the orientation, nutritional assessment and counseling are taught and students' attitudes toward nutrition recommendations are assessed. Students are encouraged to choose nutrition-based projects during primary care rotations, and nutrition curricula are included in primary care and surgery clerkships. Web-based resources are also provided for inpatient and outpatient management of nutritional

issues, including overweight and obesity. A Clinical Nutrition or Preventive Cardiology elective are also available to 4th year students. Teaching on the subjects of obesity, metabolic syndrome, weight loss treatments, and nutrition are provided to family medicine, pediatric, and internal medicine residents as well as for cardiology fellows by the faculty and staff of the Preventive Cardiology Program and primary care faculty. A one-year Preventive Cardiology fellowship is offered to graduating residents from cardiology, internal medicine, and family medicine.

Contact:

Patrick McBride, M.D., M.P.H.
Professor of Medicine and Family Medicine
Associate Dean for Students
University of Wisconsin School of Medicine and Public Health
pem@medicine.wisc.edu

Wright State University Boonshoft School of Medicine

The Boonshoft Physician Leadership Development Program is a five-year curriculum that provides medical students with the opportunity to participate in seminars that develop leadership skills as well as completing either an M.B.A. or M.P.H. degree.

Beginning in 2005, these students were given a special project to develop population health critical thinking skills and presentation skills. Each class must create a population health-based approach to address obesity. The students are encouraged to use analytical skills and creativity. Students prepare by visiting neighborhoods and schools as well as doing formal literature research. Proposals are presented using standard presentation software and may not exceed 20 minutes.

Presentations have included the analysis of geographic proximity of grocery stores offering fresh fruits and vegetables in poor urban neighborhoods; the lack of playgrounds, walking trails, and even

sidewalks in newer suburban communities; a Web-based "concierge" service that would make it possible for working people "on the run" to track their dietary intake, plan daily menus, and obtain information on correct choices when eating out; school-based initiatives including rolling back corporate influence through vending machine contracts or implementing new programs designed to encourage daily physical activity for all students rather than competitive programs for elite athletes only. Two of the proposals were selected for presentation at a recent regional meeting concerning the obesity epidemic.

Although created as a contemporary health problem for medical students in a dual degree leadership development program, this project would work well for small-group peer-led presentations in the standard curriculum.

Contact:

James R. Ebert M.D., M.B.A.
Associate Professor, Department of Community Health and Department of Pediatrics
Program Director, Boonshoft Physician Leadership Development Program
Division of Health Systems Management
Wright State University Boonshoft School of Medicine
james.ebert@wright.edu

Electronic and Print Resources

Internet Resources

(Please note that this list is not exhaustive.)

American Academy of Pediatrics

www.aap.org/obesity/

American Academy of Pediatrics policy statement titled *Prevention of Pediatric Overweight and Obesity*.

American College of Preventive Medicine

www.acpm.org/polstmt_weight.pdf

American College of Preventive Medicine Practice Policy Statement on *Weight Management Counseling for Overweight Adults*

American College of Sports Medicine

www.acsm-msse.org/pt/re/msse/positionstandards.htm;jsessionid=GQSTVL4Yg438fJ1pLChvvl15tzzh27GtW4XyTKpLyTyyJJT7rQt!370594218!181195629!8091!-1

A collection of the American College of Sports Medicine's official "Position Stands", including the 2001 Position Stand, *Appropriate Intervention Strategies for Weight Loss and Prevention of Weight Regain for Adults*

American Medical Association

www.ama-assn.org/ama/pub/category/10931.html

The American Medical Association's *Roadmaps for Clinical Practice series: Assessment and Management of Adult Obesity*.

www.ama-assn.org/ama1/pub/upload/mm/433/ped_obesity_recs.pdf

Expert Committee Recommendations on the Assessment, Prevention, and Treatment of Child and Adolescent Overweight and Obesity, released June 2007.

Centers for Disease Control and Prevention

www.cdc.gov/nccdphp/dnpa/obesity/

CDC activities and educational resources on overweight and obesity prevention and treatment, including:

Nutrition Resources for Health Professionals

Includes the *Weight Management Research to Practice* series which summarizes the science of weight management for health professionals, patients, and communities. www.cdc.gov/nccdphp/dnpa/nutrition/health_professionals/practice/index.htm

Overweight and obesity trends
Data and maps tracking the prevalence of overweight and obesity. www.cdc.gov/nccdphp/dnpa/obesity/trend/index.htm

Dietary Guidelines for Americans 2005

www.health.gov/dietaryguidelines/dga2005/document/

Dietary guidelines developed every 5 years since 1980 by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture. The *Guidelines* provide advice for people two years and older about good dietary habits and serve as the basis for Federal food and nutrition education programs.

Food and Drug Administration

www.cfsan.fda.gov/~dms/foodlab.html

How to understand and use the nutrition facts label.

National Institutes for Health

<http://obesityresearch.nih.gov/about/about.htm>

National Heart, Lung, and Blood Institute (NHLBI)

Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults

The first evidence-based guidelines developed by the Federal Government to address overweight and obesity conditions. The guidelines were developed in cooperation with the National Institute of Diabetes and Digestive and Kidney Disease. Includes treatment algorithms and other references to aid clinicians. www.nhlbi.nih.gov/guidelines/obesity/ob_home.htm

Obesity education initiative slide sets
Includes publicly available slide sets for the *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults* and *Portion Distortion* a patient- and community-awareness campaign. http://hp2010.nhlbihin.net/oei_ss/menu.htm

Nutrition Academic Award

Products developed through the Nutrition Academic Award (NAA), a 5-year grant awarded by NHLBI and the National Institute of Diabetes and Digestive and Kidney Disease to

medical schools from 1997-2006 to encourage the development or enhancement of medical school curricula in nutrition with an emphasis on preventing cardiovascular diseases, obesity, diabetes, and other chronic diseases
www.nhlbi.nih.gov/funding/training/naa/index.htm

NHLBI Working Group on Competencies for Overweight and Obesity Identification, Prevention, and Treatment

The summary of the May 2005 meeting of this group includes recommendations for undergraduate, graduate, and continuing medical education.
www.nhlbi.nih.gov/meetings/workshops/overweight/

We Can!

We Can! is a national education program designed for parents and caregivers to help children 8-13 years old stay at a healthy weight. The site offers parent, families, community groups and health professionals resources to implement programs for parents and youth to encourage healthy eating, increase physical activity, and reduce sedentary or screen time.
www.nhlbi.nih.gov/health/public/heart/obesity/wecan/learn-it/about.htm

National Institute of Diabetes and Digestive and Kidney Disease (NIDDK)

Provides an overview of NIDDK-sponsored research in overweight and obesity
www2.niddk.nih.gov/Research/ScientificAreas/Obesity

National Initiative for Children's Healthcare Quality's Childhood Obesity Action Network

www.nichq.org/NICHQ/Programs/ConferencesAndTraining/ChildhoodObesityActionNetwork.htm

The Childhood Obesity Action Network is a Web-based national network to share knowledge, successful practices and innovation. The Network includes a broad constituency of health professionals, quality improvement leaders, childhood obesity experts and child health advocates who design and disseminate policy interventions that will enhance the ability of the healthcare system to address the obesity challenge. Resources and technical assistance to improve clinical care are available on this website, including the *Obesity Recommendations Implementation Guide* to help implement the June 2007 Expert Committee Recommendations on the Assessment, Prevention, and Treatment of Child and Adolescent Overweight and Obesity.

The Guide to Community Preventive Services

www.thecommunityguide.org/

The Guide to Community Preventive Services is developed by the Task Force on Community Preventive Services, an independent decision-making body appointed by the Centers for Disease Control and Prevention. The Guide summarizes what is known about the effectiveness, economic efficiency, and feasibility of interventions to promote community health and prevent disease. Current recommendations address population-based approaches to nutrition, obesity, and physical activity.

U.S. Preventive Services Task Force

www.preventiveservices.ahrq.gov

This independent panel of experts in primary care and prevention systematically reviews the evidence of effectiveness and develops recommendations for clinical preventive services. Current recommendations are available for: nutrition counseling, screening for overweight in children and adolescents; screening for obesity in adults; and physical activity counseling.

Print Resources

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Obesity Committee of the Council on Nutrition, Physical Activity, and Metabolism. Obesity and Cardiovascular Disease: Pathophysiology, Evaluation, and Effect of Weight Loss

An Update of the 1997 American Heart Association Scientific Statement on Obesity and Heart Disease. *Circulation*. 2006;113:898-918.

MSOP Expert Panel on Overweight and Obesity Prevention and Treatment

Jarol Boan, M.D., M.P.H.

Associate Professor of Medicine
Director of Penn State Weight Loss Clinic
Division of General Internal Medicine
Penn State College of Medicine

William Dietz, M.D., Ph.D.

Director, Division of Nutrition and
Physical Activity
National Center for Chronic Disease
Control and Prevention
Centers for Disease Control and
Prevention

Kim M. Gans, Ph.D., M.P.H., L.D.N.

Associate Professor, Institute for
Community Health Promotion
The Warren Alpert Medical School of
Brown University

Russell Harris, M.D., M.P.H.

Professor of Medicine
Sheps Center for Health Services Research
University of North Carolina at Chapel
Hill School of Medicine
Member, U.S. Preventive Services
Task Force

James Hill, Ph.D.

Professor of Pediatrics
Director, Center for Human Nutrition
Director, Colorado Clinical Nutrition
Research Unit
University of Colorado
Health Sciences Center

Joylene John-Sowah, M.D., M.P.H.

Senior Scientist, Medicine and
Public Health
The American Medical Association

David L. Katz, M.D., M.P.H.

Director, Yale Prevention Research Center
Associate Professor Adjunct in
Public Health
Yale University School of Medicine

Patrick E. McBride, M.D., M.P.H.

(Chair of the Panel)
Professor, Department of Medicine
and Family Medicine
Associate Dean for Students
University of Wisconsin School of
Medicine and Public Health

Russell R. Pate, Ph.D.

Professor, Department of Exercise Science
The Arnold School of Public Health
University of South Carolina

F. Xavier Pi-Sunyer, M.D., M.P.H.

Director, Obesity Research Center
St. Luke's-Roosevelt Hospital
Professor of Medicine
Columbia University,
College of Physicians and Surgeons

Charlotte Pratt, Ph.D., R.D.

Director, Nutrition Academic
Award Program
National Heart, Lung, and
Blood Institute
National Institutes of Health

Scott Shikora, M.D.

Professor of Surgery
Tufts University School of Medicine
Surgical Director,
Obesity Consult Center
Tufts-New England Medical Center

Tracy L. Veach, Ed.D.

Professor, Psychiatry &
Behavioral Sciences
Associate Dean for Faculty Affairs and
Development
University of Nevada School of Medicine

AAMC Staff

Carol Aschenbrenner, M.D., M.S.

Executive Vice President
Division of Medical Education

Rika Maeshiro, M.D., M.P.H.

Assistant Vice President for Public
Health and Prevention
Division of Medical Education

Rajeev Sabharwal, M.P.H.

Senior Research Associate
Center for Workforce Studies
Division of Medical School Affairs

Michael E. Whitcomb, M.D.*

Editor, Academic Medicine

Marquita Whiting

Division of Medical Education

* Michael E. Whitcomb, M.D., convened the expert panel while he was Senior Vice President of the Division of Medical Education.

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**Association of
American Medical Colleges**

2450 N Street, N.W., Washington, D.C. 20037-1127

T 202 828 0400 **F** 202 828 1125

www.aamc.org