Science-based solutions to obesity: what are the roles of academia, government, industry, and health care?1–5

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ABSTRACT
The complexity of the obesity epidemic requires the cooperation of key stakeholders in this effort. No one sector, academia, government, industry, or health care, has been successful in combating this disease to date. On March 10–11, 2004, The Harvard Medical School Division of Nutrition hosted the symposium “Science-Based Solutions to Obesity: What is the Role of Academia, Government, Industry, and Health Care?” as a platform to address the role of these stakeholders, both individually and collectively, in combating the nation’s epidemic of obesity. The proceedings from the symposium, included in this supplement, discuss the following: the science of obesity-related topics such as genetics, protein and weight loss, portion size, energy density, and behavior; the need for more aggressive government policies; industry’s role in using research and development capabilities to promote healthier, portion-controlled products; and how to translate nutrition information from medical doctors to patients. Am J Clin Nutr 2005;82(suppl):207S–10S.

KEY WORDS  Health care, nutrition, obesity, overweight, symposium

Obesity is one of the most daunting health challenges of the 21st century (1). It is related to ≈1–400 000 deaths per year (2) and costs society an estimated $117 billion in direct and indirect costs (3). Between 1986 and 2000, the prevalence of severe obesity [body mass index (BMI) ≥40 kg/m2] quadrupled from 1 in 200 Americans to 1 in 50. Adults with a BMI of ≥50 kg/m2 (super-obese) increased by a factor of 5, from 1 in 2000 to 1 in 400 (4, 5). Children and adolescents suffered a similar fate. In the past 30 y, the prevalence of overweight in pediatric age groups has nearly tripled (6). At present, ≈9 million children over 6 y of age are considered obese (7).

The symposium’s theme of collaboration mirrored the direction of national health policy in the fight against obesity. The National Institutes of Health (NIH) has launched a cohesive, multidimensional, NIH-wide research agenda for addressing the problem of obesity. In 2003, the National Heart, Lung, and Blood Institute held a “Think Tank,” a major meeting that brought together a diverse group of stakeholders from the academic, consumer, and professional communities to develop research recommendations (1). The symposium brought these groups together again to assess progress in the science, treatment, and prevention of obesity.

America’s losing battle against obesity has made it clear that teamwork, the best combined efforts of academia, government, industry, and health care, is required to stop the epidemic. Each member of the team has a critical role to play. The symposium provided a forum in which to explore those roles. This year’s event included 14 presentations, two general discussions, and a panel session with representatives from academia, government, industry, and health care. Speakers covered a wide range of topics encompassing different disciplines of ongoing obesity research. The first day focused on the science and physiology of obesity and weight control; the second focused on strategic initiatives to address the problem.

A presentation by Allen M Spiegel (8) described the NIH Obesity Research Task Force. Established in 2003, its charge is to engage NIH-wide resources in a coordinated campaign to accelerate progress in obesity research. The Task Force recently released its Strategic Plan for NIH Obesity Research (1), an ambitious and detailed agenda that leverages expertise throughout the NIH and targets research efforts to the areas of greatest promise, including molecular, physiologic, and behavioral research.

Another session focused on the relationship between obesity and genes (9). Evidence from twin and adoption studies indicates that genes make substantial contributions to obesity (10). Twin

1 From the Harvard Medical School Division of Nutrition, Boston, MA.
3 This symposium was supported by The Coca-Cola Company Family of Brands, ConAgra Foods, Healthy Foods of America, McNeil Nutritionalis, Nestle Nutrition Institute, Nutrition & Health Partnership, The Peanut Institute, Slim Fast Foods Company, and Wyeth Nutritionalis. The proceedings of this symposium are published as a supplement to the American Journal of Clinical Nutrition. This supplement is a synthesis of the presentations, discussions, and ideas put forth over those two days. Guest editors for the supplement publication were George Blackburn (Harvard Medical School) and W Allan Walker (Harvard Medical School). The Harvard Medical School, Division of Nutrition, in conjunction with the American Dietetic Association Foundation and the ADA Weight Management Practice Group, sponsored an additional presentation of relevant sections of this symposium at the ADA Food and Nutrition Conference Expo on October 2, 2004, in Anaheim, CA.
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In the context of overeating and energy-deficit experiments, gene-environment interactions also affect energy balance (11). Joel Hirschhorn described methods being used to identify human obesity genes and noted the importance of animal models in advancing understanding.

George L. Blackburn (12) identified the need to update and refine medical school curricula as a key objective in the fight against obesity. He focused on widespread health illiteracy (13): how it perpetuates the epidemic and how best practices in teaching and learning can help doctors teach their patients about the basics of healthy eating. Evidence suggests that the process of change is a gradual one, especially in adults (14). Blackburn explained that The Academy at Harvard Medical School (15) has started that process by spearheading innovations in education, by giving physicians the knowledge (16) and skills they need to help patients make healthy foods choices (17).

In noting that physicians face a world of new challenges, best addressed by innovation, Blackburn cited changes in the highly regarded advisory report on the 2005 Dietary Guidelines for Americans (18, 19), particularly the high-profile use of Institute of Medicine reference intakes for macronutrients (20). He also described how the first of nine key Dietary Guidelines messages, consume a variety of foods within and among the basic food groups while staying within energy needs, mirrors the acronym CQE (Count Calories, Choose Quality Foods, and Exercise Daily), a concept developed by S. Daniel Abraham, founder of SlimFast Foods and the driving force behind the Center for Healthy Living at Harvard Medical School (21).

The Nutrition Academic Awards Program (22) is another effort to spearhead innovations, in nutrition education and in ways to integrate the subject into medical school curricula and medical practice. Nutrition is known to be an important component in establishing a healthy lifestyle and preventing major causes of diseases that commonly affect Americans (23). Any approach that helps physicians practice preventive medicine, and teach their patients how to do so, contributes to the national health agenda. W Allan Walker described two such approaches, the WAVE (weight, activity, variety, and excess) and REAP (rapid eating and activity assessment for patients) assessment tools, developed by a Nutrition Academic Awards recipient at Brown University (24, 25).

Another presentation discussed tools and tactics used by those who have been successful at long-term weight loss (26), those who have lost ≥30 lb (14 kg) and maintained the loss for more than 1 y. Data from the National Weight Control Registry (27) indicate that diet and exercise are the cornerstones of success. Rena Wing described patterns of behaviors associated with long-term weight loss, including the following: eating a low-fat, low-calorie diet; having breakfast; tracking weight on regular basis; eating a consistent diet; quickly addressing small weight gains; and maintaining high levels of physical activity.

In a session on Physical Activity and Body Weight Control, John Jakicic (28) described the role that physical activity plays in maintaining weight loss. Studies show that exercise is an important component of weight-control programs and that a higher duration and intensity of exercise may improve long-term weight loss (29). Jakicic explained that sedentary lifestyles and obesity are intricately linked (30) and encouraged health care providers to identify and address obstacles that prevent their patients from becoming more active (29).

Gary Foster (31) spoke on the subject of behavior, particularly the influence of health care providers on the behavior of their patients. Studies suggest that brief interventions by physicians can change patient behavior (32) and that frequent contact with health care providers can contribute to success. He noted that patients respond strongly to positive reinforcement and cited data showing that health care professionals can play a pivotal role in curbing the epidemics of obesity and inactivity (30).

The degree to which the obesogenic environment undermines that role is of growing interest to academia, government, industry, and health care. In a presentation on Portion Size and the Obesity Epidemic, Barbara Rolls (33) discussed the contribution of ever-bigger serving sizes to the obesity crisis and the connection between energy density and satiety. Data indicate that the larger the portion, the more people eat (34). They also show that low-energy, high-density foods (eg, fruits, vegetables, and salads) provide satiety that can result in decreased total intake (35).

Popular diets (eg, the Atkins Diet) have brought increased attention to macronutrient intake, especially protein. Recent studies suggest that high-protein diets produce greater short-term weight loss than low-fat diets (36) but that the difference does not last beyond 1 y (37–39). High-protein diets are also purported to improve cardiovascular risk factors and blood lipid profiles. In his presentation on Protein, Body Weight, and Cardiovascular Health, Frank Hu (40) reviewed recent research examining the effects of protein on cardiovascular health, and he underscored the need for long-term data on the safety of high-protein, ketogenic diets.

To date, weight loss surgery (41) is recognized as the most effective means for producing long-term weight loss and reduction of obesity-related comorbidities in appropriately selected patients (42–44). Of the various surgical options available, Roux-en-Y gastric bypass is considered the gold standard (44). Surgery is fundamentally different from dieting. It changes the physiology to reset energy equilibrium, affects the complex weight regulatory system at multiple levels, inhibits environmental influences on weight regulation, and defeats powerful mechanisms that are inappropriately active in obesity.

Ultimately, obesity is a matter of imbalance: a mismatch between energy in and energy out. Susan Finn (45) discussed the ways that industry is working to correct that imbalance. In particular, she cited community-based programs for children, commitments to develop and market healthy products that promote portion control, and a willingness to practice responsible advertising. Donald Short (46), in a presentation on Coca-Cola’s initiatives to fight obesity, underscored the importance of coordinated efforts by business, academia, government, and health care. Pat Verduin (47) from ConAgra echoed that message, noting that industry is already bringing healthier foods to market, that it has a critical role to play in public education, and that strong partnerships will benefit everyone.

Tomas Philipson (48) discussed the Food and Drug Administration’s multifaceted attack on obesity, a broadside that includes targeted messaging and proposed changes in the design of food labels. He cited the need to make food labels easier to read and understand and to improve communication with an increasingly diverse US population. Adam Drewnowski (49) addressed the related subject of health disparities in America. He cited statistics showing that the prevalence of overweight and obesity is higher in minority groups, especially African Americans.
and Hispanics, than it is in whites (1). He noted that the ultimate goal of the NIH is to give every American an equal opportunity to lead a healthy life.

As long as the obesity epidemic goes unchecked, that goal will remain out of reach. Obesity will continue to take its toll on the health care system, the economy, and the quality of life for millions of Americans. A recent study estimated annual medical spending as a result of overweight and obesity (BMI $\geq 25$) to be as much as $92.6$ billion in 2002 dollars (9.1% of US health expenditures) (50). Annual indirect costs of obesity to US businesses in the form of health insurance expenditures, paid sick leave, life insurance, and disability insurance have been estimated at $12.7$ billion (51–53).

At the final panel discussion of the 2004 Postgraduate Nutrition Symposium at Harvard Medical School, Science-Based Solutions to Obesity: What are the Roles of Academia, Government, Industry, and Health Care?, someone from the audience asked a question: Where do we go from here? The science and physiology of obesity, and the efforts underway to fight it, were the focus of this year’s symposium, illustrating that we are now attacking the problem on every possible front, from laboratories at major pharmaceutical firms to local community health centers. The diversity represented by the symposium’s guest speakers, and their commitment to a work together in common cause, is significant in and of itself, a milestone in the fight against obesity. In a closing statement, George L. Blackburn noted that we have come a long way, even in just the past 5 y, but still have a long way to go (54).

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REFERENCES


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