

Research on Obesity and Overweight

AHRQ-Supported Research and Recent Findings

The mission of AHRQ is to improve the quality, safety, efficiency, and effectiveness of health care by:

- Using evidence to improve health care.
- Improving health care outcomes through research.
- Transforming research into practice.

Introduction

Over the past several decades, the prevalence of obesity among adults and children in the United States has increased dramatically and is now reaching epidemic proportions. The prevalence of obesity in adults in the United States was 30.5 percent in 1999-2000. More than twice as many adults (nearly 65 percent) were considered to be either overweight or obese. Some 6 million U.S. adults were considered morbidly obese in 2001. In 2002, an estimated 15 percent of all children aged 6 to 19 years were overweight.

Obesity is more common in women, but men are more likely to be overweight. Obesity is especially common among African Americans, American Indians, Native Hawaiians, and some Hispanic populations.

Obesity is the second leading cause of preventable deaths; smoking is the first. Obesity is associated with many significant health problems, including high blood pressure, heart disease, diabetes, stroke, osteoarthritis, sleep apnea, premature death, and decreased

quality of life. Even modest weight loss can reduce an individual's risk for these diseases and outcomes.

Obesity is defined as having a body mass index (BMI, weight in kg/height in m²) of 30 or more. For example, a 5'5" woman weighing 180 pounds or more or a 5'11" man weighing 215 pounds or more would be termed obese. Morbid obesity is defined as having a BMI of 40 or more (35 to 40 with medical problems related to obesity). Overweight is defined as having a BMI of 25 to 29.9 (a 5'5" woman who weighs 150 pounds or more or a 5'11" man who weighs 180 pounds or more). A BMI of 20 to 24.9 is considered normal weight, and a BMI under 20 is considered underweight.

In children and adolescents, weight above a normal range has different terms: at risk for overweight and overweight. Being at risk for overweight is defined as a BMI between the 85th and 94th percentile for age and sex; overweight is defined as a BMI at or above the 95th percentile for age and sex.





AHRQ's Commitment

Obesity is a substantial health problem in the United States. It contributes to poor health and functioning, emotional problems, premature death, and escalating health care costs. For many years, the Agency for Healthcare Research and Quality (AHRQ) has supported research on obesity and overweight in adults and children. Since 2003, AHRQ has committed nearly \$2.8 million to support research on obesity and overweight. This program brief summarizes AHRQ-supported research on obesity and overweight, including current and completed projects, recent findings, and several conferences.

An asterisk (*) following a summary indicates that reprints of an intramural study or copies of other publications or materials are available from AHRQ. See the back cover of this program brief for ordering information and contacts for more information on AHRQ research programs and funding opportunities. Also, we invite you to visit AHRQ's Web site at www.ahrq.gov to learn more.

Obesity in Adults

Effects on Health and Health Care

AHRQ-Supported Research Projects

- *Projecting consequences of better health for older adults.*

The goal of this completed project was to augment an existing risk-factor model to make it suitable for examining the impact of important public health programs and goals on middle-aged and older adults (ages 45-74). The augmented model will be capable of exploring the consequences over time of changes in such risk factors as smoking, obesity, high blood pressure, and chronic disease on mortality, hospitalization, and nursing home admission. Louise Russell, Principal

Investigator, Rutgers State University, New Brunswick, NJ. AHRQ grant HS11477, project period 6/1/01-1/31/03.

- *Disparities in care: Obesity and cancer screening.*

For this completed study, researchers used national data collected as part of the 1998 National Health Interview Survey and AHRQ's 1996 Medical Expenditure Panel Survey (MEPS). The goals were to (1) compare the rates of screening for colon, prostate, breast, and cervical cancer between people with and without obesity; (2) examine whether differences in cancer screening rates associated with obesity vary by sex or race; and (3) examine whether differences in screening rates could be explained entirely by the higher illness burden experienced by people with obesity. Christina Wee, Principal Investigator, Beth Israel Deaconess Medical Center, Boston, MA. AHRQ grant HS11683, project period 9/30/01-9/29/03.

- *Obesity, weight loss, and access to preventive care.*

The broad objectives of this completed research project were to assess whether intentional weight loss reduces mortality and to examine whether obesity acts as a barrier to preventive health care. Using data from the National Health Interview Survey, the researchers focused on the odds of receiving certain forms of preventive care such as Pap smears, mammography, and cholesterol testing, as well as identification of health risks by a health provider. The goals were to improve clinicians' ability to assess any long-term benefit from intentional weight loss and help them identify obese individuals as an at-risk population with respect to preventive health care. Christina Wee, Beth Israel Deaconess Medical Center, Boston, MA. AHRQ grant F32 HS00137, project period 11/1/99-10/31/00.

Recent Findings

- *Obesity contributes to significantly lower quality of life.*

Researchers from the Mercer University School of Medicine examined the relationship between obesity and health-related quality of life in people aged 18 and older using data from the 2000 MEPS. After adjusting for socioeconomic factors and disease status, they found that quality of life decreased with increasing levels of obesity. Individuals who were obese had significantly lower health-related quality of life than those who were normal weight. These lower scores were seen even for obese people who did not have chronic diseases known to be linked to obesity. Jia and Lubetkin, *J Public Health* 27(2):156-164, 2005 (AHRQ grant HS13770).

- *Obesity is associated with decreased health status and a higher incidence of depression.*

For this study, researchers randomly assigned 509 new adult patients to primary care physicians at a university medical center and monitored their use of services and related charges over 12 months. They found that obese patients were more likely to be women than men, were older, had poorer health status, and had a higher incidence of depression. Obese patients had a significantly higher number of visits to both primary care and specialty clinics and used more diagnostic services than non-obese patients. Obese patients also had significantly higher charges for primary care, specialty clinic, emergency services, hospitalization, and diagnostic services, as well as higher total charges. Bertakis and Azari, *Obes Res* 13(2):372-379, 2005 (AHRQ grant HS06167).

- *Researchers find that obesity impacts the medical visit.*

The goal of this study was to investigate the influence of patient obesity on primary care physician practice style. This randomized, prospective study involved 509 patients assigned for care by 105 primary care resident physicians. The researchers collected sociodemographic information and data on health status, evaluation for depression, and satisfaction. Height and weight were measured to calculate the patients' BMI. Analysis of visit videotapes revealed that obesity was not significantly associated with the length of the visit, but it influenced what happened during the visit. Physicians spent less time educating obese patients about their health and more time discussing exercise. Obesity was not related to discussions about nutrition. Physicians spent a greater portion of the visit on technical tasks when the patient was obese. Although pre-visit satisfaction was significantly lower for obese patients, there was no difference between obese and non-obese patients in post-visit satisfaction. Bertakis and Azari, *Obes Res* 13(9):1613-1623, 2005 (AHRQ grant HS06167).

- *Obese white women are less likely than other women to undergo mammography to screen for breast cancer.*

According to this study, obese white women are less likely than non-obese white women to undergo breast cancer screening, a relationship not seen in black women. Using data from the National Health Interview Survey, the researchers examined the relationship between body mass index and receipt of breast cancer screening in the preceding 2 years among women aged 50 to 75. Among the 5,277 eligible women, 72 percent reported mammography use (74

percent for white women and 70 percent for black women). Higher BMI was associated with lower screening among white women. Mammography use was lowest in women with a BMI greater than 35. Moderately obese white women (BMI 35 to 40) were 17 percent less likely to have had a mammogram than normal weight white women. Adjusting for socioeconomic status and illness burden did not change the findings. The researchers suggest that negative body image and provider bias may account in part for these findings. Wee, McCarthy, Davis, and Phillips, *J Gen Intern Med* 19:324-331, 2004 (AHRQ grant HS11683).

- *More prevalent severe obesity may explain black/white disparity in stage at breast cancer diagnosis.*

Black women are typically diagnosed with breast cancer at a later stage than white women, putting them at greater risk of dying from the disease. According to this study, higher rates of morbid obesity among black women compared with white women may be a major factor in this disparity. In this study, black women were twice as likely as white women to be overweight and six times as likely to be morbidly obese. Also, black women were twice as likely to be diagnosed when the tumor was larger or had spread to nearby lymph nodes. Overall, morbid obesity accounted for about one-third of the racial difference in stage of breast cancer diagnosis, even after accounting for other factors such as age, socioeconomic status, history of breast cancer screening, lifestyle, and reproductive history. This study involved 145 black women and 177 white women diagnosed with new cases of breast cancer in Connecticut in the late 1980s. Jones, Kasl, McCrea, Curnen, et al., *Am J Epidemiol* 146(5):394-404, 1997 (AHRQ grant HS06910).

- *Mammography found to be less accurate for obese women.*

Overweight women have a 14 percent increased risk and obese women more than a 20 percent increased risk of having a false-positive mammogram. False-positive mammography results lead to increased anxiety for women and unnecessary health care costs for additional testing to evaluate the false-positive results. In this study, overweight women were 17 percent more likely to be recalled for further testing, while mildly obese women (BMI of 30-34) were 27 percent more likely to be recalled, and severely obese women (BMI of 35 or more) were 32 percent more likely to be recalled. Elmore, Carney, Abraham, et al., *Arch Intern Med* 164:1140-1147, 2004 (AHRQ grant HS10591).

- *Obesity may be a barrier to cancer screening.*

This study found an inverse relationship between body weight and cervical and breast cancer screening, suggesting that obesity may be an unrecognized barrier to preventive care. The researchers analyzed survey responses of 11,435 women who responded in the year 2000 to the National Health Interview Survey. They found that among women aged 18 to 75 who had not had a hysterectomy, 78 percent of overweight and obese women reported having a Pap smear in the preceding 3 years, compared with 84 percent of normal weight women. In women aged 50 to 75, fewer overweight (64 percent) and obese (62 percent) women had received a mammogram in the preceding 2 years, compared with normal weight women (68 percent). Heavier women were usually older, were less likely to be white or to have private health insurance, had lower socioeconomic status, and suffered a greater burden of illness. Yet there was still a 3 to 5 percent difference

in screening rates after adjustment for these and other known barriers to care. Wee, McCarthy, Davis, and Phillips, *Ann Intern Med* 132(9):697-704, 2000 (AHRQ grant F32 HS00137).

- *Morbidly obese women are more likely than others to develop colorectal cancer and die from it but are less likely to be screened.*

Colorectal cancer is the second leading cause of cancer death in the United States, and screening is the key to early diagnosis and treatment. In this study of almost 53,000 people aged 51 to 80, morbidly obese women (BMI of 35 or more) were nearly 6 percent less likely to be screened than normal weight women. The researchers examined self-reported colorectal cancer screening with fecal occult blood testing (FOBT) within the previous year or endoscopic screening (sigmoidoscopy or colonoscopy) with the previous 5 years. The overall colorectal cancer screening rate was 43.8 percent. Rosen and Schneider, *J Gen Intern Med* 19:332-338, 2004 (AHRQ grant T32 HS00020).

- *Being overweight or underweight does not preclude elective noncardiac surgery for most patients.*

Relatively healthy overweight and underweight patients are not at any higher risk than normal weight patients for complications or longer hospital stays following many types of elective, noncardiac surgery. However, overweight people who undergo elective abdominal or gynecologic surgery have double the wound infection rates of normal weight patients, according to this study. Also, the most underweight and overweight patients have higher costs, perhaps indicating that more resources are expended on these patients to prevent complications. For this study, the researchers correlated the BMI of nearly 3,000 patients aged 50 and older

undergoing elective noncardiac surgery with complications, length of hospital stay, and costs. Thomas, Goldman, Mangione, et al., *Am J Med* 102:277-283, 1997 (AHRQ grant HS06573).

- *Obese older adults tend to have lower quality of life than normal or overweight individuals.*

The researchers evaluated the relationship between BMI and health-related quality of life scores among 1,326 adults with a mean age of 72 years. The goal was to estimate quality-adjusted life years lost to overweight, obesity, and associated conditions. Participants were divided into four groups: underweight, normal weight, overweight, and obese. After controlling for age, sex, smoking history, and exercise, the normal BMI group had the highest score on the Quality of Well Being scale. The score for the obese group was much lower, suggesting a substantially lower quality of life. The researchers conclude that nearly 3 million quality years are lost in this country each year from obesity and associated conditions. Groessl, Kaplan, Barrett-Connor, and Ganiats, *Am J Prev Med* 26(2):126-129, 2004 (AHRQ grant HS09170).

- *Regular exercise can reduce the risk of health decline among middle-aged adults.*

Maintaining ideal body weight is important in preventing decline in overall health and physical functioning. But this study found that regular exercise can reduce the risk of health decline even among those who cannot achieve ideal weight. The researchers used 1992, 1994, and 1996 data to examine the relationship among BMI, exercise, overall health, and physical functioning in 7,867 adults who were aged 51 to 61 during the study period. Overweight and obese individuals had a 29 percent and 36 percent, respectively,

higher risk of health decline. They also had a 27 percent and 45 percent, respectively, higher risk of developing a new physical difficulty (e.g., being unable to climb a flight of steps without resting). However, regular exercise significantly reduced the risk of health decline and development of a new physical difficulty, even among obese individuals. For example the risk of developing a new physical difficulty was 17 percent lower for those who performed vigorous activities less than once per month to as much as 43 percent lower for those who performed vigorous activities three or more times per week. He and Baker, *Am J Public Health* 94(9):1567-1573, 2004 (AHRQ grant HS10283).

- *Researchers examine the associations between psychological eating behavior variables and body weight and size.*

This study involved 1,470 women aged 45-68 enrolled in the Whitehall II study of English civil servants. The researchers examined the association between restraint, hunger, and disinhibition and body weight and size. Five measures of body size were examined: BMI, weight in kilograms, waist measurement, hip measurement, and waist-hip ratio. The researchers found that disinhibition and hunger scores were strongly and directly associated with all measures of body weight and size. High disinhibition coupled with low levels of restraint was associated with the greatest weight and size. The authors conclude that these may be useful concepts for future research on the socioeconomic gradient in obesity and overweight. Dykes, Brunner, Martikainen, and Wardle, *Int J Obes Relat Metab Disord* 28(2):262-268, 2004 (AHRQ grant HS06516).

- *Obesity is one of several factors affecting need for inpatient rehabilitation.*

Individuals who undergo total hip replacement usually gain substantial pain relief and improved functioning. Those who are older, obese, living alone, or unable to walk at discharge are more likely to be discharged to a rehabilitation facility than directly home, according to this study. The researchers analyzed data on 1,276 patients aged 65 to 94 who had hip replacement surgery in 1995.

Over half of the patients were discharged from the hospital to a rehabilitation facility. After adjusting for other factors, those who were obese were 29 percent more likely to be discharged to a rehabilitation facility. Pablo, Losina, Phillips, et al., *Arthritis Rheum* 51(6):1009-1017, 2004 (AHRQ grant HS09775).

- *Obesity contributes to early-onset heart problems.*

Although obese adults undergo coronary angioplasty and other techniques to relieve coronary narrowing at a younger age than people who are not obese, weight does not appear to affect their recovery from these procedures. The researchers classified 1,631 patients who underwent percutaneous coronary intervention (PCI) as underweight, normal weight, overweight, or obese. They examined patients' need 12 months later for repeat procedure, survival, quality of life, and health status. They found that obese patients were significantly younger than other patients at the time of PCI. However, overweight and obese patients appeared to benefit just as much from PCI as normal-weight patients, while underweight patients had poorer outcomes than patients in other weight groups. Poston, Haddock, Conard, and Spertus, *Int J Obes* 28:1011-1017, 2004 (AHRQ grant HS11282).



- *Obese individuals stay in the hospital longer than normal-weight individuals.*

These researchers used survey data to estimate hospital stay differences over four 5-year periods among patients in five groups: (underweight, normal weight, overweight, obese, and morbidly obese). Overweight and obese individuals had longer hospital stays than normal-weight individuals, although the association between BMI and length of stay varied over the four time periods. During the 1971-1975 period, for example, their stays were 25 percent (overweight), 45 percent (obese), and 54 percent (morbidly obese) longer. For the period 1976-1980, their stays were 60 percent, 94 percent, and 218 percent longer, respectively. With the exception of one followup period, underweight individuals had longer hospital stays than normal-weight individuals, probably due to illness-induced weight loss. Zizza, Herring, Stevens, and Popkin, *Am J Public Health* 94:1587-1591, 2004; see also Zizza, Herring, Stevens, and Carey, *Obes Res* 11(12):1519-1525, 2003 (AHRQ grant T32 HS00032).

- *Obesity appears to be more prevalent in adults with sensory, physical, and mental health conditions.*

One-quarter of adults with disabilities are obese, compared with 15 percent of those without disabilities, according to this 1994-1995 survey of more than 145,000 community-dwelling adults. The highest risk for obesity was among people with lower extremity mobility difficulties. In general, adults with disabilities were as likely as those without disabilities to attempt weight loss. However, adults with severe lower extremity mobility difficulties were less likely to attempt weight loss, and those with mental illness were more likely to

try to lose weight, compared with nondisabled adults. Exercise counseling by physicians was reported less often among adults with severe lower extremity and upper extremity mobility difficulties. Weil, Wachterman, McCarthy, et al., *JAMA* 288(10):1265-1268, 2002 (AHRQ grant HS10223).

- *Lower educational attainment is associated with a higher BMI.*

These researchers used data on 665 overweight or obese primary care patients participating in an ongoing obesity intervention to examine whether psychosocial and behavioral factors mediate the relationship between sociodemographic factors and BMI. They found that after controlling for decisional balance, social support, self-efficacy, energy intake, and energy expenditure, lower educational attainment was associated with a higher BMI. However, ethnicity was not associated with BMI after accounting for psychosocial and behavioral factors. They conclude that cross-sectional relationships between demographic, psychosocial, and behavioral variables and BMI are complex. They call for more research to devise better weight management strategies. Baughman, Logue, Sutton, et al., *Prev Med* 37:129-137, 2003; see also Sutton, Logue, Jarjoura, et al., *Obes Res* 11(5):641-652, 2003 (AHRQ grant HS08803).

- *Study finds little difference in patient satisfaction among obese compared with non-obese patients.*

Patients with obesity experience psychosocial consequences because of their weight and sometimes report physician bias. These researchers examined whether obesity is associated with lower patient satisfaction with outpatient care. The study involved 2,858 patients seen at 11 academically affiliated primary care practices in Boston. Compared with normal weight

patients, overweight and obese patients reported lower overall satisfaction scores at their most recent visit. However, after adjustment for illness burden and other factors, the scores were still lower but were not statistically significant. Patient satisfaction with their usual provider and practice did not vary by BMI group. The researchers conclude that obesity is associated with only modest decreases in satisfaction scores, which are explained largely by a higher illness burden among obese patients. Wee, Phillips, Cook, et al., *J Gen Intern Med* 17(2):155-159, 2002 (AHRQ grant F32 HS00137).

- *Study finds obesity is linked with area of residence, resources, land use, and other environmental factors.*

The built environment includes urban design factors, land use, and availability of public transportation, as well as the available activity options for people within that space. These researchers reviewed published research on the influence of the built environment on obesity. Although the studies varied in their methods and levels of assessment (individual, county, etc.), they did show that obesity is linked with area of residence, resources, television, terrain and suitability for walking, land use, sprawl, and level of deprivation. The built environment can both facilitate and hinder physical activity and healthful eating. For example, poorer neighborhoods have three times fewer supermarkets than wealthier neighborhoods but contain more fast-food restaurants and convenience stores. Also, areas with safety concerns, few recreational facilities, uneven and hilly terrain, and/or insufficient lighting can hinder physical activity. In contrast, residents in neighborhoods with more available physical activity resources, including sidewalks and safe streets, report higher activity levels. Booth,

Pinkston, Walker, and Poston, *J Am Diet Assoc* 105(5 Suppl 1):S110-117, 2005 (AHRQ grant HS11282).

- *One-third of people misidentify themselves as overweight, underweight, or normal weight.*

In this study, researchers analyzed how adults classified their weight in a 1991 survey. They found that about 28 percent of overweight people judged their weight to be “just about right,” while 24 percent of people who thought they were overweight were in fact normal weight or underweight according to their BMI. Overall, 17 percent of people underassessed their weight category, and 12 percent overassessed their weight category, based on BMI. Men were more likely than women to fail to recognize that they were overweight; 40 percent of overweight men considered their weight to be “just about right” compared with 15 percent of overweight women. On the other hand, 29 percent of normal weight women thought they were overweight compared with 8 percent of normal weight men. Adults who were white, younger, more educated, or more affluent were more likely than others to consider themselves heavier than their actual BMI. Chang and Christakis, *J Gen Int Med* 16:538-543, 2001 (AHRQ grant T32 HS00084).

Health Care Costs

Recent Findings

- *Hospital costs associated with weight-loss surgery increased six-fold between 1998 and 2002.*

The number of Americans having weight-loss surgery more than quadrupled between 1998 and 2002—from 13,386 to 71,733—with part of the increase resulting from a 900 percent rise in operations on patients between ages 55 and 64, according to

this study. During the same period, hospital costs for weight-loss surgery increased from \$157 million a year to \$948 million, and the average cost per surgery increased by about 13 percent, from \$11,705 to \$13,215. To be considered medically eligible for weight-loss surgery (bariatric surgery), a patient must have a BMI greater than 40 (or greater than 35 with serious obesity related complications such as diabetes or obstructive sleep apnea). Approximately 395,000 Americans aged 65 to 69 were medically eligible for this surgery in 2005. This number could increase by approximately 20 percent to 475,000 by 2010. If this happens, it will have important cost implications for the Medicare program, according to the authors of the study. Encinosa, Bernard, Steiner, and Chen, *Health Aff* 24(4):1039-1046, 2005. Reprints (AHRQ Publication No. 05-R059) are available from AHRQ (Intramural).*

- *Total health care expenditures are higher for obese individuals compared with those who are overweight or normal weight.*

Researchers examined data from AHRQ’s MEPS on health care costs in 2002 for adults aged 55 and older. They found that obese individuals had higher total mean expenses for medical care compared with people in other weight groups. The mean total expense for obese individuals was \$7,235, compared with \$5,390 and \$5,478 for normal weight and overweight individuals, respectively. The mean inpatient expense for obese individuals was \$2,555, compared with \$1,727 for normal weight individuals and \$1,698 for overweight individuals. Prescription medicine expenditures were also higher for obese people. The mean expense was \$1,688 for obese people, \$1,089 for normal weight people, \$1,184 for overweight individuals, and \$1,121 for

those who were underweight. For more information, go to www.meps.ahrq.gov and select “Statistical Briefs” and then “Statistical Brief No. 68” (Intramural).*

- *Study examines correlation between diabetes, obesity, and health expenditures.*

Data from the Household Component of MEPS show that in 2000, over \$18 billion was spent on health care for people with diabetes. Research has consistently shown that the obesity epidemic is a major contributing factor in the increasing number of people who have diabetes and other health conditions. According to this study, adults with diabetes were more than three times as likely to be extremely obese and nearly twice as likely to be obese as adults without diabetes. For more information, go to www.meps.ahrq.gov and select “Statistical Briefs” and then Statistical Brief No. 34 (Intramural).*

- *Data show relationship between weight and health insurance status.*

Researchers compared MEPS data from 1987 and 2001 to examine trends in weight and health insurance status. They found that for all categories of health insurance status, there was an increase in obesity during the time period studied. Adults with public only health insurance were the most likely to be obese in 1987 (22.8 percent) and 2001 (31.1 percent), a 36 percent relative increase over the period. There was a relative increase in obesity of 84 percent for individuals with private insurance (from 12.8 percent to 23.6 percent) and a relative increase of 60 percent for the uninsured (from 13.9 percent to 22.2 percent). For more information, go to www.meps.ahrq.gov and select “Statistical Briefs” and then “Statistical Brief No. 37” (Intramural).*



- *Gastric bypass can dramatically improve the health of severely obese individuals at a reasonable cost.*

These researchers performed a cost-effectiveness analysis of gastric bypass versus no treatment for relatively healthy women and men aged 35 to 55 who had a BMI between 40 and 50. Conservative therapies—such as diet, exercise, behavior therapy, and medication—had been unsuccessful for these people. Although there was a risk of postoperative death and complications, gastric bypass resulted in a mean 58 percent loss of excess weight (above a BMI of 22) 5 years later. In all risk subgroups, the cost-effectiveness ratios of gastric bypass versus no treatment were favorable, at less than \$50,000 per quality-adjusted life year. The ratios ranged from about \$5,000 to \$16,000 for women and from about \$10,000 to \$35,600 for men, depending on age and initial BMI. Since the reduction in lifetime medical cost was no greater than the cost of treatment in any subgroup, gastric bypass was not cost-saving from the payer perspective. This study did not include severely obese patients with chronic medical conditions for whom the surgical risks, as well as the benefits of weight loss, would be greater. Craig and Tseng, *Am J Med* 113:491-498, 2002 (AHRQ grant T32 HS00083).

Screening and Treatment

AHRQ-Supported Research Projects

- *A primary care intervention for obesity.*

The goal of this completed study was to improve health professionals' recognition and management of obesity. The project involved implementation of a multifaceted intervention combining academic detailing, information technology, and organizational

development. The impact of the intervention was evaluated by measuring before and after changes in the prevalence of obesity diagnoses and physician screening for BMI as recorded in medical charts of a sample of adult and pediatric patients. The study was carried out in a practice-based research network of community health centers staffed by 88 physicians and 42 mid-level practitioners who are safety-net providers for over 80,000 uninsured and Medicaid managed care patients. Everett Logue, Principal Investigator, Summa Health System, Akron, OH. AHRQ grant HS08803, project period 5/1/98-4/30/03.

- *Building the Alabama practice-based research network.*

This completed project involved infrastructure development and research translation using personal digital assistants (PDAs). One component of the project involved a pilot feasibility study on obesity, using PDAs to gather data that could serve as the basis for a larger study aimed at improving patient care and reducing illness and deaths related to obesity. T.M. Harrington, Principal Investigator, University of Alabama at Birmingham. AHRQ grant HS13529, project period 9/30/02-9/29/05.

- *Practice-based research network development and utilization of PDAs in research.*

This completed project involved infrastructure development of a practice-based research network comprising 22 practice sites in 18 counties in Georgia and one practice in South Carolina. The practices serve a patient population that is largely poor and rural and more than one-third African American. In this project, researchers tested the effectiveness of a handheld computer communication system to increase the translation of research evidence into

practice in the area of obesity management. Physicians, practicing at randomly assigned intervention or control sites, received obesity treatment updates either to their PDAs or via traditional e-mail only (control). Transmitted information included current guidelines and new findings in obesity treatment. Peggy Wagner, Principal Investigator, Medical College of Georgia, Augusta. AHRQ grant HS13513, project period 9/30/02-9/29/05.

- *APRNet: Enhancements and pilot work.*

This completed developmental/exploratory grant was focused on enhancing the capacity of APRNet, the first practice-based research network for advanced practice nurses. One of the objectives was to conduct a pilot/feasibility study on the translation of research findings on management of obesity to primary care practice. Goals included (1) assessing knowledge and attitudes within the network about overweight and obesity identification, evaluation, and treatment; and (2) developing and pilot testing an intervention protocol to enhance primary care management of obesity. Margaret Grey, Principal Investigator, Yale School of Nursing, New Haven, CT. AHRQ grant HS13493, project period 9/30/02-9/29/04.

Recent Findings

- *Several popular diets confer similar benefits, with best results from strict adherence.*

Findings from this study challenge the idea that one type of diet works for everybody, and that low-carb diets work better than standard diets. The study showed that several popular diets resulted in similar weight loss and reduction of several cardiac risk factors over a 1-year period. Dietary adherence,

not type of diet, was the key to success, according to the researchers. They randomized 160 adults aged 22 to 72 years to one of four popular diets: Weight Watchers, Atkins, the Zone diet, and the Ornish diet. All were overweight or obese and had several risk factors for cardiac problems (e.g., high blood pressure). Participants were more likely to drop out of the study with the more extreme diets (Atkins and Ornish) than with the moderate diets (Zone and Weight Watchers). Among those who completed the study, mean weight loss at 1 year was 4.6 lbs for Atkins, 7 lbs for Zone, 6.6 lbs for Weight Watchers, and 7.3 lbs for Ornish. Dansinger, Gleason, Griffith, et al., *JAMA* 293(1):43-53, 2005 (AHRQ grant T32 HS00060).

- *Patients at risk for cardiovascular disease should be counseled about diet and exercise during outpatient visits.*

A growing number of Americans have conditions that increase their risk for heart attack and stroke. These include high cholesterol, high blood pressure, diabetes, and obesity. Despite national recommendations to counsel such patients about diet and exercise to reduce their risk, counseling remains suboptimal according to this study. The researchers found that throughout the 1990s, clinicians provided diet counseling in less than 45 percent of office visits and physical activity counseling in 30 percent or fewer visits by adults with conditions that place them at increased risk for cardiovascular disease. Visits to internists and cardiologists were more likely to include diet and physical activity counseling than visits to general and family physicians. Obese patients and those with hyperlipidemia were much more likely than other patients to be counseled about diet and physical activity. On the other hand, a positive diagnosis of coronary heart disease was

not associated with any discernible effect on the likelihood of either type of counseling. Ma, Urizar, Alehegn, and Stafford, *Prev Med* 39:815-822, 2004 (AHRQ grant HS11313).

- *Studies examine rates of morbid obesity and bariatric surgery and risk of death after surgery.*

Bariatric surgery reduces the size of a person's stomach to a tiny pouch, usually bypassing the small intestine. The majority of patients lose 50 to 75 percent of their body weight within 2 years and keep it off. It is the most effective therapy for certain patients with morbid obesity, yet from 0.5 to 1.5 percent of patients die in the hospital after the operation. In the first study, researchers examined regional differences in morbid obesity and bariatric surgery rates, as well as risk factors for death after surgery. They identified nearly 70,000 patients who underwent the surgery in 2002 and found that the rate of morbid obesity was lowest in the Northeast and West and highest in the Midwest and South. However, the rates of bariatric surgery per 100,000 morbidly obese individuals ranged from a low of 139 in men aged 60 and older in the Midwest to a high of 5,156 in women aged 40 to 49 in the Northeast. In the second study, researchers identified nearly 55,000 adults who underwent bariatric surgery in 2001 and found that being male, older than age 39, insured through Medicare, or needing additional surgery during the initial hospitalization are factors that increase the risk of postoperative death. Poulouse, Holzman, Zhu, et al., *J Am Coll Surg* 201:77-84, 2005; and Poulouse, Griffin, Moore, et al., *J Surg Res* 127:1-7, 2005 (AHRQ grant T32 HS13833).

- *Minimal intervention found to be no more effective than augmented usual care to change behavior among obese patients.*

The hypothesis for this study was that after 2 years of treatment, obese patients exposed to an obesity intervention would experience a greater decrease in body weight compared with similar patients who received augmented usual care. The study involved 336 patients. Those in the augmented usual care group received dietary and exercise advice, prescriptions, and three 24-hour dietary recalls every 6 months. Patients in the intervention group received the augmented care elements, plus “stage of change” assessments for five target behaviors every other month, mailed workbooks, and monthly telephone calls from a weight-loss advisor. The researchers found that the intervention was not powerful enough relative to augmented usual care to alter target behaviors among overweight and obese primary care patients. Logue, Sutton, Jarjoura, et al., *Obes Res* 13(5):917-927, 2005 (AHRQ grant HS08803).

- *Clinician's aid focuses on managing obesity.*

Incorporating evidence-based approaches to reducing obesity—including screening; counseling; medication; and surgery, when appropriate—may be effective in managing obesity. In 2004, AHRQ published a clinician's aid on managing obesity that highlights research from the Agency's evidence-based practice program. This research informs many science-based recommendations in the public and private sectors, including the U.S. Preventive Services Task Force. This tool provides recommendations for clinicians on screening, counseling, referring, and treating obesity. Copies of *Managing Obesity: A Clinician's Aid*

(AHRQ Publication No. 04-0082) are available from AHRQ.*

- *Sibutramine can help manage obesity but may not be appropriate for certain patients.*

Clinical trials of sibutramine—a medication that has been approved for long-term management of obesity—in obese individuals have demonstrated significant weight loss and better weight maintenance than placebo. Sibutramine helps weight loss by increasing feelings of fullness and satisfaction. The drug has established general safety and efficacy in long-term trials. However, because the drug increases heart rate and blood pressure, it may be not be appropriate for use in obese patients with significant cardiovascular disease or uncontrolled hypertension. Also, its appropriateness for use in special populations, such as people with binge eating disorders, has not been established. Poston and Foreyt, *Expert Opin Pharmacother* 5(3):633-642, 2004 (AHRQ grant HS11282).

- *AHRQ evidence report reviews the science on pharmacologic and surgical treatment of obesity.*

In July 2004, AHRQ published a summary of an evidence report prepared for the Agency by the Southern California-RAND Evidence-based Practice Center. In the summary, the researchers assess the efficacy and safety of various weight loss medications and surgical procedures as reported in the scientific literature. They found no evidence that any particular drug promotes more weight loss than another drug. They note that weight loss attributed to pharmacologic treatment is modest but still may be significant. Also, they found that surgical treatment is more effective than nonsurgical treatment for weight loss and control of some coexisting illnesses. Although

surgical treatment was found to be associated with a substantial number of complications and adverse events, most of these were minor. *Pharmacological and Surgical Treatment of Obesity*, Evidence Report/Technology Assessment 103 (AHRQ Publication Nos. 04-E028-1, summary and 04-E028-2, full report), is available from AHRQ (contract 290-02-0003).*

- *Exercise may not mitigate the weight gain of late middle age.*

In this study, both men and women aged 51 to 61 in all ethnic groups gained weight from 1992 to 2000, and their current levels of physical activity did not appear to protect against weight gain. The researchers analyzed activity level and changes in weight and BMI over the 8-year study period of 7,391 ethnically diverse community-dwelling adults. The mean weight gain was higher for women (3.67 pounds) than for men (3.15 pounds). White men and women had the lowest baseline BMI but tended to gain more weight than individuals from other racial groups. After controlling for other factors, those who were older or had higher baseline weight showed less weight gain. Men who reported poor health at baseline were less likely to gain weight than those who reported excellent health. Race, education, and income were not associated with weight gain. Also, regular light or vigorous recreational activities, household chores, or work-related activities were not associated with less weight gain. The authors conclude that high-frequency, moderate-intensity exercise is needed for weight loss. He and Baker, *Am J Prev Med* 27(1):8-15, 2004 (AHRQ grant HS10283).

- *Primary care physicians see a substantial portion of the obese population but often do not counsel patients to lose weight.*

Researchers examined reports of outpatient visits to study patterns of physician-patient communication around weight control. The reports covered 633 encounters in family practices in a Midwestern State. They found that 68 percent of adults and 35 percent of children were overweight. Excess weight was mentioned in 17 percent of encounters with overweight patients, while weight loss counseling occurred with 11 percent of overweight adults and 8 percent of overweight children. During weight loss counseling, patients formulated weight as a problem by making it a reason for a visit or asking for help with weight loss. Clinicians framed weight as a medical problem in itself or as an exacerbating factor for another medical problem. The researchers conclude that strategies to increase the likelihood of patients identifying weight as a problem and strategies that provide clinicians with a way to “medicalize” the patient’s obesity are likely to increase the frequency of weight loss counseling in primary care visits. Scott, Cohen, DiCicco-Bloom, et al., *Prev Med* 38(6):819-827, 2004 (AHRQ grants HS08776 and HS09788).

- *Researchers examine the relationship over time between elapsed time and the stages of change for weight loss behaviors.*

This study involved 329 middle-aged men and women with elevated BMI recruited from 15 primary care practices in Northeastern Ohio. The target behaviors examined were increased planned exercise and usual physical activity, decreased dietary fat, increased fruit and vegetable consumption, and increased dietary portion control. The main outcomes were weight loss (5

percent or more) or weight gain (5 percent or more) after 18 or 24 months of followup. The researchers found significant longitudinal relationships between weight loss (or gain) and the time in action or maintenance for each of the five target behaviors. They note that the remaining challenge is to identify those factors that reliably move patients into the action and maintenance stages for long periods. Logue, Jarjoura, Sutton, et al., *Obes Res* 12:1499-1508, 2004 (AHRQ grant HS08803).

- *Task Force recommends that clinicians screen adults for obesity.*

In December 2003, the U.S. Preventive Services Task Force issued their recommendation that clinicians screen all adults for obesity. They also recommended that clinicians offer obese patients intensive counseling and behavioral interventions to promote sustained weight loss or refer them to other clinicians for these services. They also noted that clinicians should consider measuring patients for centrally located body weight, which is independently associated with cardiovascular disease, using waist circumference as a measure. Men with a waist circumference greater than 40 inches and women with a waist circumference greater than 35 inches are at increased risk for cardiovascular disease. The Task Force noted, however, that these measurements may be inaccurate for people with a BMI greater than 35. The Task Force recommendation and related articles were published in the same issue of the 2003 *Annals of Internal Medicine*, as follows: McTigue, Harris, Hemphill, et al., *Ann Int Med* 139(11):933-949; U.S. preventive Services Task Force, *Ann Int Med* 139(11):930-932; and Summaries for patients, *Ann Int Med* 139(11):157. Task Force recommendations and related materials are also available online



at the AHRQ Web site. Go to www.ahrq.gov and select “Preventive Services.”

- *Weight goals for younger people may not be appropriate for elderly people.*

According to this study, extra weight may be protective for the elderly. The researchers found that obese elderly people were less likely to die than those who were thin or normal weight, even after adjusting for differences in medical problems and income. They analyzed data from a nationally representative sample of 7,527 community-dwelling adults aged 70 and older in 1984 to calculate the impact of BMI on their risk of death over an 8-year period. Subjects were divided into three groups: thin (BMI less than 19), normal weight (BMI 20-28), and obese (BMI 29 or greater). The thin group had the highest mortality rate (54 percent), the obese group the lowest (33 percent), and normal-weight individuals were in the middle (37 percent). Grabowski and Ellis, *J Am Geriatr Soc* 49:968-979, 2001 (AHRQ grant T32 HS00084).

- *A patient's willingness to make dietary and lifestyle changes is key to sustained weight loss.*

This study found that most patients are receptive to losing weight under their doctor's supervision, but that patients vary in their readiness to adopt specific weight-loss behaviors. For instance, some patients may be ready to increase their exercise but not to reduce the fat in their diet. Others may be ready to eat more fruits and vegetables but not to eat smaller portions of food. The researchers administered questionnaires to 284 obese family practice patients to examine their receptivity (stage of change) to six target behaviors: dietary fat, portion control, vegetable intake, fruit intake, usual physical activity, and planned exercise. The resulting profiles

indicate which behavior(s) a patient is ready to work on at any given clinical visit and can be used by doctors to help their patients lose weight over time. Logue, Sutton, Jarjoura, and Smucker, *J Am Board Family Pract* 13:164-171, 2000 (AHRQ grant HS08803).

- *Specific interventions to address obesity are infrequent in visits to U.S. physicians.*

For this study, researchers analyzed more than 55,800 adult physician office visits sampled in the 1995-1996 National Ambulatory Medical Care Surveys to assess reporting of obesity during office visits and physician counseling for weight loss, exercise, and diet among patients identified as obese. They found that physicians reported obesity in only 8.6 percent of visits. Among visits by patients identified as obese, physicians frequently provided counseling for weight loss, exercise, and diet. However, each service was provided to no more than one-quarter of all obese patients. Patients with obesity-related illnesses were treated more aggressively, yet weight loss counseling occurred at only 52 percent of the visits. Stafford, Farhat, Misra, and Schoenfeld, *Arch Fam Med* 9(7):631-638, 2000 (AHRQ grant HS07892).

Overweight in Children and Adolescents

AHRQ-Supported Research Projects

- *Treatment of children with overweight in primary care.*

This current project is applying concepts from the chronic care model to the problem of pediatric overweight. Researchers are assessing the effectiveness of teaching primary care providers to use specific communication strategies with parents of overweight children to help them take steps with their child toward healthy behavior

change. Second, they are offering core components of a family-based behavioral weight management program within the pediatric primary care setting to determine if participating children will achieve clinically meaningful weight loss. Third, they are assessing the ability of trained, practice-based staff members to offer the treatment so that desired outcomes are achieved. The three principal outcomes are: (1) a change in the frequency with which providers counsel parents of overweight children; (2) a change in the child's diet, physical activity, weight, and BMI percentiles after treatment and at 6-month followup; and (3) a comparison of child outcomes in groups led by trained staff compared with those in groups led by experienced interventionists. Ellen Wald, Principal Investigator, Children's Hospital, Pittsburgh, PA. AHRQ grant HS14862, project period 11/1/05-10/31/07.

- *Improving overweight care in pediatric offices.*

The goal of this current project is to improve communication about childhood and adolescent overweight in the offices of pediatricians. The project has four objectives: (1) describe the current frequency of evaluation by pediatricians of obesity in children aged 6 to 17; (2) assess the experiences and attitudes of pediatricians in diagnosing and discussing overweight, particularly the interpersonal barriers to labeling a child as overweight; (3) assess experiences and attitudes of adolescents and parents of younger children in discussing overweight with the pediatrician to learn which approaches are acceptable, as well as those that either alienate or motivate them; and (4) test the effect on pediatricians' self-efficacy of an intervention that teaches them how to address overweight to create an alliance with parents and

families and motivate them to make changes. Analysis of interviews and focus groups will assist in developing the content of an educational program that will be assessed in pre- and post-testing of pediatricians. Sarah Barlow, Principal Investigator, St. Louis University, St. Louis, MO. AHRQ grant HS13901, project period 9/1/03-8/31/08.

- *Tools to improve nutritional health in primary care.*

The goal of this completed pilot study was to test the implementation of a program to assist health providers in the interpretation of child growth and the routine delivery of nutritional counseling in two pediatric practices. One practice served a majority of white, privately insured patients; the other was a community health center serving low-income African American and Hispanic patients. The goal was to allow practices to more easily include routine growth interpretation and child-specific counseling on healthy behaviors, thus increasing the motivation of physicians to address this key area. Adolfo Ariza, Principal Investigator, Children's Memorial Hospital of Chicago, Chicago, IL. AHRQ grant HS14431, project period 9/30/03-12/31/05.

Recent Findings

- *DVDs help parents and clinicians address overweight in children.*

In 2004, AHRQ and Discovery Networks, Inc., worked in partnership to develop two DVDs—*Max's Magical Delivery: Fit for Kids and Childhood Obesity: Combating the Epidemic*—in response to the growing problem of childhood overweight in the United States. *Max's Magical Delivery* is a fun, interactive DVD targeted to children ages 5-9 and their families. The DVD offers suggestions on daily diet, use of TVs and video games; and physical

activity. There is a separate section for parents on small, achievable steps they can take to encourage healthy habits in their children and themselves.

Childhood Obesity is a complementary DVD targeted to clinicians. It addresses both prevention and treatment, including screening and counseling of children who are overweight or at risk for overweight. It provides helpful clinical tools such as BMI measurement in children and tips for initiating and sustaining behavior change in children. This DVD contains educational materials eligible for CME and CE credits that can be obtained through the Centers for Disease Control and Prevention (CDC). *Max's Magical Delivery* (AHRQ Publication No. 04-0088-DVD) and *Combating the Epidemic* (AHRQ Publication No. 04-0089-DVD) are available from AHRQ.*

- *Task Force examines evidence on screening for overweight in children and adolescents.*

In July 2005, the U.S. Preventive Services Task Force issued their recommendation on screening children and adolescents for overweight. The Task Force recognized childhood overweight as an important public health issue, and they noted that it is important to measure and monitor growth over time in all children and adolescents. However, they did not find enough evidence to show that routine screening for overweight will identify children who are at risk for future adverse health outcomes, such as cardiovascular disease. This finding by the Task Force of "insufficient evidence" (an "I" recommendation) is a call to action for the research community to focus future research efforts on addressing gaps in the evidence on child and adolescent overweight. Published online at

www.pediatrics.org/cgi/content/full/116/1/e125. Also, go to the AHRQ Web site at www.ahrq.gov and select "Preventive Services" for more information about this and other Task Force recommendations.

- *Clinicians are more likely to counsel youngsters who have been diagnosed as overweight.*

According to this study, when overweight is diagnosed in children aged 2 to 18, clinicians are more likely to counsel them and their parents about diet and exercise during well-child visits. Based on an analysis of 1997-2000 survey data, the researchers found that clinicians diagnosed overweight at less than 1 percent of 39,930 ambulatory pediatric visits. When patients were diagnosed as being overweight at well-child visits, clinicians assessed their blood pressure and counseled them about diet and exercise more often than they did for patients at visits where overweight was not diagnosed. Factors associated with diet counseling were diagnosis of overweight, being seen by a pediatrician, aged 2 to 5 years compared with 12 to 18 years, and self-pay compared with private insurance. Factors were similar for exercise counseling, except exercise counseling occurred half as often in visits with black youths compared with visits with white youths. Cook, Weitzman, Auinger, and Barlow, *Pediatrics* 116(1):112-116, 2005 (AHRQ grant HS13901).

- *Dietary control and physical activity can help overweight children lose weight.*

Excess weight in children and adolescents is due primarily to poor eating habits and inactivity, according to these researchers. They recommend that children eat at least five servings of fruits and vegetables each day, engage in moderate physical activity for at least 60



minutes on most days, and limit their TV viewing and computer use to no more than 2 hours a day. Parents and clinicians should strive first to maintain a child's baseline weight. Weight loss of no more than 1 pound per month is recommended in children aged 2 to 7 who have a secondary weight-related complication such as high blood pressure. Weight loss should be considered for children aged 7 and older if their BMI for age is 95 percent or greater or they are at risk for becoming overweight (BMI for age of 85 to 95 percent) and they have secondary complications. Greaser and Whyte, *Consultant*, online at www.ConsultantLive.com, 2004. Reprints (AHRQ Publication No. 05-R011) are available from AHRQ. (Intramural).*

- *Late bottle weaning is associated with an increased risk of overweight.*

The American Academy of Pediatrics recommends introducing the cup to babies at 6 months and complete bottle weaning at 15 months of age. Yet 20 percent of toddlers aged 2 and 9 percent of those aged 3 are still using a bottle. Prolonged bottle use in young children is associated with increased risk of overweight, according to this study. Compared with normal-weight infants, overweight infants are more likely to be overweight in the preschool years and are at increased risk of obesity in later life. This study involved survey results for a sample of nearly 3,000 children aged 3 to 5 years. The mean age of bottle weaning was 18.8 months. Children less than the 85th percentile BMI (normal weight) were weaned at an average of 18 months, compared with 19 months for those in the 85-95th percentile BMI (overweight) and over 22 months for children greater than the 95th percentile BMI (obese). Each additional month of bottle use

corresponded to an approximate 3 percent increase in the odds of being in a higher BMI category. Bonuck, Kahn, and Schechter, *Clin Pediatr* 43:535-540, 2004 (AHRQ grant HS10900).

- *Prolonged bottle feeding of young children may lead to childhood obesity and iron deficiency anemia.*

The authors of this study warn that prolonged and/or excessive bottle use may increase a young child's risk of developing iron deficiency anemia or becoming overweight. They surveyed caregivers of 95 children aged 18-56 months (most children were Hispanic or black) about bottle use. Half of the children were overweight, 36 percent were obese, and 21 percent met CDC criteria for anemia. Two-thirds of the children received daily bottles of milk or sweet liquids, with children receiving anywhere from 3 to 10 bottles a day. Bottle use was significantly associated with anemia and obesity but not with overweight. Bonuck and Kahn, *Clin Pediatr* 41:603-607, 2002 (AHRQ grant HS10900).

- *Minority youths are more likely than white youths to be overweight.*

According to this study, African-American and Hispanic children aged 6 to 11 in the United States are significantly more likely than non-Hispanic white children of the same age to be overweight, while Asian and Pacific Islander children are slightly less likely to be overweight. Using data from AHRQ's 1996 MEPS, the researchers found that 43.9 percent of the African-American children were overweight, as were 37.4 percent of Hispanic children. The researchers also found that 21.1 percent of non-Hispanic white children and 19.6 percent of Asian and Pacific Islander children had excess weight. Haas, Lee, Kaplan, et al., *Am J Public Health* 93(12):2105-2110, 2003 (AHRQ grant HS10856).

Conferences

- *Expert panel meeting focused on safety issues in bariatric surgery.*

Although the demand for and use of bariatric surgery are growing, there is little information on long-term outcomes and safety-related issues, including data on variations in outcomes related to surgical site and expertise/experience of the surgeon. In October 2004, AHRQ convened an expert panel meeting focused on bariatric surgery. The meeting involved a roundtable of experts in bariatric surgery and other key stakeholders who examined what is known about the safety of these surgical procedures, the need for additional safety data, and options for meeting data needs.

- *2005 conference highlights efforts to eliminate obesity and health disparities.*

In July 2005, AHRQ and the National Cancer Institute cosponsored the third annual Translating Research Into Practice (TRIP) conference, which was held in Washington, DC. The conference theme was “Highlighting Obesity and Health Disparities Reduction.” Presenters shared innovative research and implementation methods, case studies, and other experiences.

For More Information

Please visit AHRQ’s Web site at www.ahrq.gov for more information on the Agency’s activities related to obesity

and overweight, including information about funding opportunities. Or, you may contact:

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