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Medicine & Health
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Obesity

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Cover: This Shell Heart image was created from a variety of Shirley Bell's watercolors. The artist began painting in watercolor 25 years ago. Paralyzed in a car accident when she was 16, Shirley has been determined to live a full and prosperous life. She is inspired by her natural surroundings on Conanicut Island, in Jamestown. Her originals began selling in galleries and gift shops through out the country. To keep up with the demand, Shirley began reproducing her artwork in giclee form. In 2006 she launched Shirley Bell Designs, which features over 300 of her images on stationery and gift items. www.shirleybelldesigns.com

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COMMENTARIES

CONTRIBUTIONS

SPECIAL FOCUS: Obesity
Guest Editor: Rena R. Wing, PhD

COLUMNS

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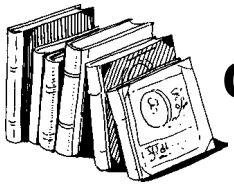

Commentaries

Acronyms: What's In a Name?

I sometimes work out wearing a t-shirt from the **Parkinson Study Group (PSG)**, a clinical research consortium I belong to, which boasts the many studies the PSG has successfully completed, all having acronyms, with their names arrayed in a Scrabble-like format. I am a little embarrassed by the shirt because of these acronyms. I would much prefer a small logo. The acronyms themselves had become a source of personal irritation which had been dying down until a recent article in *JAMA* ("Extremities," Sept 10, 2008) revived it. Believe it or not, trials with acronyms are more commonly cited than those without, and protocols with acronym titles are thought to more likely be funded than those without (*NEJM* 2006;355:101).

What this says about clinical researchers who review or cite the studies is unclear, but I doubt that it's good. I'm sure every reader has watched advertisements on TV and wondered who that ad was intended to influence. Was it the 13 year-old boy embedded within the 60 year-old man that would allow him to view a beautiful young female model and confuse her with an expensive gas-guzzling car? Was it the teenage girl in the pudgy, middle-aged woman who thinks that an expensive diamond will put the thrill in the marriage again? Do we really think that an Olympic athlete dripping colored sweat sells Gatorade? Obviously groups with larger amounts of money than most of us believe this. So why will a study called DAZLE be more likely to be successful than a study called "Disability after zirconium-levodopa enteral infusions," possibly then called the "Z study" or merely the "zirconium study?" [this study is made up. I'm not sure about the acronym. It may have been a *New England Journal of Medicine* article whose name, not content, made a dent in my memory, perhaps an example justifying acronyms]

There is a company that makes its living creating names for new products. They came up with "Lexus," an obvious success. I don't know about their other inventions but I think they too have experienced successes. When the Ford motor company launched a new car in the fifties it hired the poetess, Marianne Moore, to supply a list of names for its models. Whether it was due to the name or the car itself, the company rejected her suggestions and, instead, named the car after a member of the Ford family, making poor Edsel Ford's name synonymous with poor quality and failure.

I have been involved in a series of trials of a single drug for Parkinson's disease that have taken for their names the tempos of classical music. The first study in the series was TEMPO, then LARGO, PRESTO, and the last, ADAGIO, which suitably was aimed at slowing disease progression. Some of these acronyms arise quite naturally, with the abbreviated goal of the study naturally spelling some appealing name, either exactly or closely, allowing the official title to be teased into a form that allows the acronym to fall out rather easily. Sometime the acronym comes first. These names are more annoying because they have taken on an unfortunate life of their own and often provide no information on what the study was about.

I have had two flings at acronyms, the first successful and the second not. The title of my first proposal was "low-dose clozapine for the treatment of psychosis in Parkinson's disease." This does not easily translate into a catchy name, but "Psychosis and clozapine for Parkinson's psychosis" became PSYCLOPs, a rather catchy title which I came up with myself. I even invented a logo of a smiling face with one eye. The logo was used informally, the acronym officially and the project funded by the federal government. My next proposed study was pretty close to the first but with a different drug, quetiapine. So the trial name became: quetiapine against psychosis in PD, or QUAP. I thought this rather clever, reflecting perhaps a strain of sophomoric humor in an otherwise elderly persona determined to emanate otherwise a sense of gravitas. When I presented my proposal at a reverse site visit at the **National Institutes of Health (NIH)**, a friend at the funding agency pulled me aside and told me that I had to change the name of the study. "Some people will think you're saying your study's name is "CRAP!" In fact that was the point. I thought it rather clever and assumed that the reviewers would also find this clever and amusing, perhaps even bold, and give me extra points. They did not. They seemed to think it was, in fact, crap, thereby erasing "clever, amusing and bold," and substituting instead "second rate," or "loser." The resubmission of the study, without an acronym, aroused no complaint but no interest either and the proposal died an unheralded death.

I recently voted with the rest of my steering committee to accept the name "APLIED" for a study of an experimental drug, Aplindore, in Early Parkinson's Disease, benign if uninspired. Why not simply "The Aplindore Study?" I would have preferred it, but not my colleagues. They like SEESAW, TEAPOT, CONCEPT, PRECEPT, names that convey no useful information (these are real study names).

Are the days of "The Framingham Study" gone? I hope not. Would that have been funded in recent years with an antediluvian name like that?

How about CURMUDGEON, or TROGLODYTE?

– Joseph H. Friedman, MD

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Through Caverns Measureless To Man

"Man" said Protagoras (481 – 411 BCE), "is the measure of all things." In an ancient world where approximations of physical measurement were readily accepted, such a declaration would be tolerated both by the community's builders and those who reveled in metaphors. But by the 17th Century, scientific advances in physics and astronomy, augmented by the earliest stirrings of an industrial revolution, demanded more exactitude. Scientific instruments, for example, could no longer be constructed based solely on loosely determined, arbitrary criteria of length. The French astronomer, Jean Picard [1620 – 1682 CE] proposed that a more precise, more reliable measure of length be established. He recommended that this unit of measurement (to be called a meter, from the Greek *metron*) be determined by the length of a pendulum beating one-second at sea level, at a latitude of 45 degrees. And as astrologists and soothsayers were gradually replaced by astronomers, precision in measurement became an operative necessity.

It was not until 1790, after the onset of the French Revolution, that its National Committee appointed a study group to select which of three terrestrial criteria will be employed to determine the precise length of the meter: (1) the length of a pendulum beating one-second; (2) a specified fraction of the length of the equator; or (3) a specified fraction of the quadrant of the terrestrial meridian (a great circle of the globe passing through both poles and a predetermined point on the global surface). The commission voted for option (3) and a team of surveyors was commissioned to measure the meridional arc between Dunkirk, in France, to Mont Jany, in eastern Spain. The surveyors required seven years to measure the exact distance between these two chosen sites.

The Commission on Standards of Length broadened its assignment also to include measurements of volume and weight. They acknowledged that there were but three fundamental measurable quantities: length, mass and time; and from these three, all other quantities would be derived, such as weight, density and velocity. Two immediate tasks, however, demanded fulfillment. First, to establish and then maintain structurally reliable standards of reference, tangible prototypes that can be reproduced by predetermined criteria and then stationed in archival vaults throughout the world. And second, to seek out the most reliable means for the determination of the standard of length, weight or volume. And while some measure of experimental error is unavoidable, the needs of science and advancing industry demanded a slippage of no more than one part per one-hundred million. A new science, called metrology, was thus born.

A number of insistent questions arose: What social forces impelled the creation of metrology ? Why did it begin at the end of the 18th Century and not before? And why in France ?

The 17th Century confronted, and was forced to negotiate commercially with a confusing hodgepodge of weights and measures. England had its pounds and quarts; the Slavic nations had their idiosyncratic system; the Near East had measurements more of historical than rational meaning; and even the jewelers had their carats. Conversion from one system to another required the patient skills of a sober accountant. And as in theology, conversion became a hazardous enterprise. The world had been truly bereft of a transnational metric system that was both uniformly employed and rational in concept. But why did it begin at the end of the 18th Century? Certainly in response to the early globalization of social and colonial activity furthered by the growth of industrial power and by the parallel expansion of international commerce.

Why France? The tumultuous revolutionary forces unleashed in 1789 overturned more than the monarchy. The French even modified the Gregorian calendar, in keeping with the precept that a new France needed a fresh outlook concerning all physical and cultural aspects of life.

The first prototype standard of the meter was a brass rod meticulously fabricated in 1795. Brass, though, like all physical substances, expanded with ambient temperature. A search was made for metals with only minimal temperature-dependent amplification. Platinum and then a platinum-iridium alloy proved to be most suitable. This standard prevailed until 1960 when the meter definition was established as equal to 1,650,763.73 wavelengths of the krypton-86 atom – measured at zero degrees Centigrade. In 1983 this definition was further refined to: "The metre is the length of the path traveled by light in vacuum during a time interval of 1/299,792,458 of a second."

Few humans, at the onset of the 21st Century, will demand such exactitude in their daily activities. Most of us are satisfied with crude metrics such as "Third down and four yards to go!" or "Give me six yards of that fabric" or "I parked six blocks from the tavern." Truly, the sciences have bestowed upon us precise measures for length, mass and volume but no measurement yet to determine the magnitude of human anxiety or the depths of human depravity.

At the end of the day each human may confront the ancient question: How has your life been measured and by what ethical yardsticks? By coffee-spoons? By the time remaining on a parking meter? By the height of your aspirations? By the magnitude of your generosity? "Lord,", said the psalmist, "make me know mine end, and the measure of my days, what it is; that I may know how frail I am."

– Stanley M. Aronson, MD

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Introduction: Obesity

Rena R. Wing, PhD

This issue of *Medicine & Health/ Rhode Island* focuses on the epidemic of obesity: 37% of Americans are overweight and an additional 26% are obese. Although Rhode Island fares better than some states, the prevalence of obesity and overweight in our state exceeds 60%. Both prevention and treatment efforts are clearly needed.

The articles were written by faculty and fellows at the Weight Control and Diabetes Research Center of The Miriam Hospital and The Warren Alpert Medical School of Brown University. Established in 1998, the Center conducts research on both pediatric and adult obesity. Current research focuses on improving initial weight loss success in pediatric and adult populations, maximizing the long-term maintenance of weight loss, and documenting the health benefits of weight loss. While this research primarily examines behavioral approaches, the impact of behavioral approaches in combination with other treatments, including bariatric surgery, is also being studied.

Research grants, primarily from the National Institutes of Health and the American Diabetes Association, support the programs at the Weight Control and Diabetes Research Center. Because of this support, these programs can typically be offered free of charge. However, those interested in participating must meet the eligibility requirements and, depending on the study, must be willing to be randomized to one of several treatment approaches.

If you are interested in learning more about our programs, or want to refer patients to one of our studies, please call the Weight Control and Diabetes Research Center at 401-793-8940.

Rena R. Wing, PhD, is Director, Weight Control and Diabetes Research Center, The Miriam Hospital and The Warren Alpert Medical School at Brown University, and Professor of Psychiatry and Human Behavior at The Warren Alpert Medical School of Brown University.

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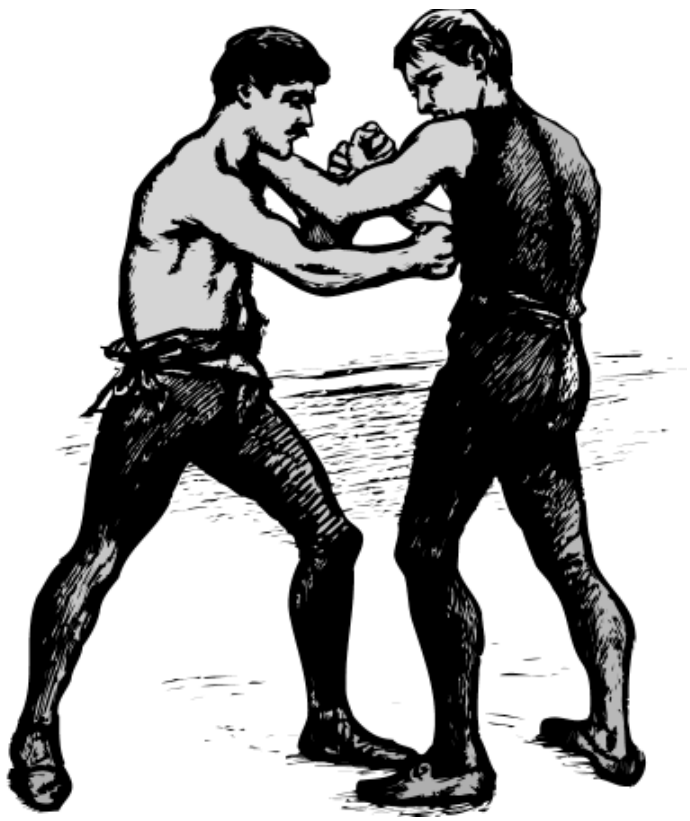

Overweight and Obesity in Rhode Island: Developing Programs to Combat the Obesity Epidemic

Becky Marquez, PhD, Tricia M. Leahey, PhD, Rena R. Wing, PhD

An estimated two-thirds of American adults are overweight or obese (**Body Mass Index (BMI)**=25-29.9; BMI≥30, respectively), an increase of 110% over the past two decades.[1-3] Furthermore, over the past 10-years the prevalence of obesity in this country has increased nearly 40%, with estimates indicating that 26% of Americans are obese.[4]

Obesity is most prevalent among the nation's two largest ethnic minority groups. Among adults, 24.7% of Non-Hispanic Whites are obese whereas 35.3% of African Americans and 27.5% of Hispanics are obese.[5] Compared to men, African American (34% vs. 53.9%) and Mexican American (31.6% vs. 42.3%) women have higher rates of obesity.[6]

Overweight and obesity are associated with serious medical problems, including type 2 diabetes, cardiovascular disease, liver problems, and cancer.[7] Obesity-related health problems cost our country $52 billon dollars per year and account for an estimated 400,000 deaths each year.[8,9] Some researchers predict that the increased rates of obesity and associated ailments will cause the first decline in life expectancy in 100 years.[10,11]

Eating and activity behaviors contribute to the obesity epidemic. For 10 consecutive years, over 75% of Americans have not met national standards for fruit and vegetable consumption[4] (at least 5 servings of fruits and vegetables per day[12]) and more than 50% have failed to meet physical activity guidelines[4] (30-minutes of moderate-intensity physical activity on five or more days per week[13]).

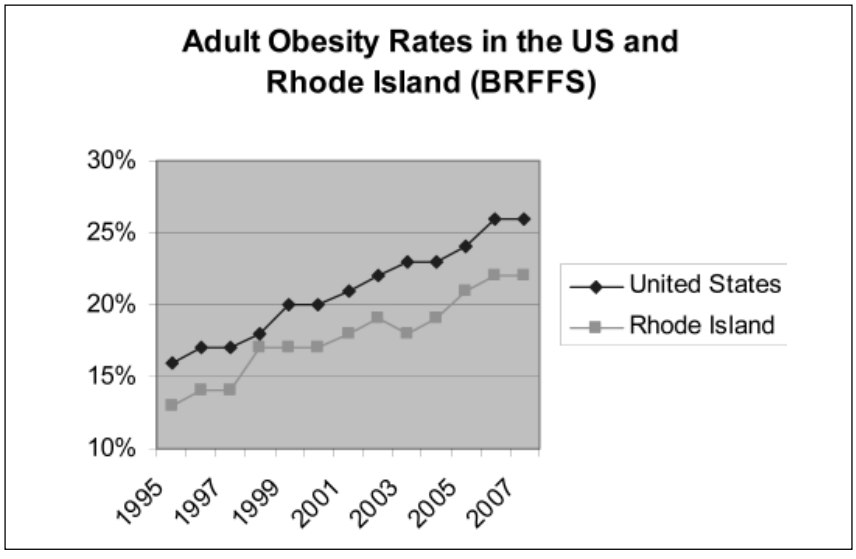

Figure 1.

Table 1. Prevalence of obesity, regular physical activity, and consumption of at least 5 daily servings of fruits and vegetables.

	Obesity (%)	Regular Physical Activity (%)	Consume ≥ 5 Fruit & Vegetable Servings Per Day (%)
African Americans	30	17	22
Hispanics	20	16	18
Non-Hispanic Whites	17	23	28

Rhode Island BRFSS 1998-2000.

Overweight and Obesity in Rhode Island

The prevalence of obesity in Rhode Island has closely paralleled that of the nation. (Figure 1)[4] Over the past decade, the number of obese adults has nearly doubled. In 2007, 22% of Rhode Island adults were obese, up from 13% in 1995.[4]

Shape-Up Rhode Island: A state-wide obesity initiative

A Healthy People 2010 objective is to reduce the proportion of obese adults to 15%. No state has met this objective. A variety of approaches to the obesity epidemic are being evaluated, including increasing access to healthier foods through farmers' markets and community gardens and increasing access to physical activity by developing parks, trails, and walking clubs.

One approach in Rhode Island is the **Shape-Up Rhode Island (SURI)** campaign. This state-wide campaign was created in 2005 by Rajiv Kumar and Brad Weinberg, medical students at Brown University. All adults in Rhode Island are invited to participate in this team-based 12 to 16-week program designed to increase physical activity and help individuals lose weight. The program has grown from approximately 2,000 in 2006, to 7,000 in 2007 and 12,000 in 2008.

Among the almost 5000 participants who enrolled in the SURI 2007 weight loss campaign, 70% completed the 12-week program. On average these individuals lost 3.2 kg, with 30% losing 5% or more of their body weight. Whereas 38% were obese at baseline only 31% were obese at follow-up.

Overweight and obesity among Rhode Island's ethnic minorities

While state-wide programs may be effective at reducing obesity among the general population, programs that target Rhode Island's ethnic minorities are imperative. African Americans (67%) and Hispanics (62%) in Rhode Island have higher rates of overweight or obesity than Non-Hispanic Whites (54%).[14] African Americans and Hispanics also have greater risk factors for obesity. According to the Behavioral Risk Factor Surveillance Survey, African Americans and Hispanics are less likely to meet the recommended guidelines for physical activity and consumption of fruits and vegetables. (Table 1) Contributing factors such as lower socioeconomic status are also more prevalent among African Americans and Hispanics in the state. Hispanics are more likely to live below the poverty level and less likely to graduate from high school than African Americans or Non-Hispanic Whites.[4] In 2006, Hispanics were reported to have a higher prevalence rate of diabetes (12.5%) than African Americans (11.6%) or Non-Hispanic Whites (6.8%).[14]

Table 2. Preliminary data of survey assessing interest in a weight loss program among Hispanics in Providence County (N=89).

	Number	Mean ± standard deviation	Percent (%)
Sex			
Female	77		86.5
Male	12		13.5
Age	87	37.1 ± 12.1	
Annual Income			
< $10,000	25		31.6
$10,00-19,999	21		26.6
$20,000-29,999	13		16.5
$30,000-39,999	11		13.9
$40,000-49,999	4		5.1
=$50,000	5		6.3
Ethnicity			
Dominican	36		41.8
Colombian	19		22.1
Puerto Rican	14		16.3
Guatemalan	6		6.9
Mexican	4		4.6
Other	7		8.3
Doctor advised weight loss within the last 12 months	62		53.2
Foreign born	78		90.7
Years in United States		12.5 ± 8.4	
Diagnosed with type-2 diabetes			
Self	4		4.5
Family member	34		38.2
BMI			
Obese	29		33.7
Overweight	34		39.5
Normal	21		24.4
Underweight	2		2.3
Participated in a commercial weight loss program	10		11.5
Interested in participating in a weight loss program	87		83.9
Weight loss program intervention preference			
Delivered in Spanish	52		65.8
Latino/a instructor	36		46.1
Group composed of only Latino members	18		22.8
Group composed of only same sex members	29		36.7

Developing Weight Loss Programs for Hispanics in Rhode Island

Given that Hispanics are the largest ethnic minority group in Rhode Island[15] and are at high risk for developing type 2 diabetes, weight loss interventions targeting this community are in great need.

Providence County is a well-suited site to implement and evaluate a behavioral weight loss intervention that includes Hispanics. Hispanics in Rhode Island, representing 10% of the population, constitute a diverse group: Dominican (27.4%), Puerto Rican (21.7%), Guatemalan (17.1%), Columbian (9.5%), and Mexican (6.9%).[15] Over 90% of Hispanics in the state reside in Providence County, which includes Providence, Pawtucket, and Central Falls.[15]

The Weight Control & Diabetes Research Center administered a questionnaire in Spanish or English at several community organizations in Providence County. The purpose was to assess interest and needs in a weight loss program among Hispanics in Rhode Island.

Data are available from 89 respondents. Most are female (87%) and overweight or obese (73%). More than half of respondents reported being advised by their physician to lose weight within the last year. While only 4% reported being diagnosed with diabetes, nearly ten times as many have family members with the disease.

Only 11% of respondents have participated in commercial weight loss programs. However, 80% indicated an interest in participating in a weight loss program. Respondents indicated a preference for a program delivered in Spanish. Almost half reported a preference for classes taught by a Latino/a. Most respondents did not prefer a program composed of only Latinos or members of the same sex.

We are also conducting a small feasibility study that evaluates whether enhancing social support by partnering 27 Latinas with a female friend or family member promotes recruitment and retention in a 12-

week behavioral weight loss program. Our eventual goal is to conduct a larger randomized-controlled study which determines weight loss outcomes among Latina participants in a behavioral weight loss program.

Conclusion

The prevalence rates of overweight and obesity in Rhode Island have increased exponentially in the past two decades. State-wide initiatives such as Shape-Up Rhode Island show promise at reducing rates of obesity in the general population. However, because Rhode Island's Hispanics and African Americans are disproportionately affected by obesity and associated health ailments, more attention must be paid to reduce rates of obesity among ethnic minorities.

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Treatment of Pediatric Obesity

Elissa Jelalian, PhD, Chantelle N. Hart, PhD, and Kyung Rhee, MD, MSc

The prevalence of childhood overweight has more than tripled in the past several decades.[1] Nationally, 26% of children age 2-5 years, 37% of grade school children and 34% of adolescents are overweight (Body Mass Index [BMI] for age and gender ≥85th percentile but <95th percentile) or obese (BMI for age and gender ≥95th percentile).[1] Rhode Island's children rank 15th in terms of the number of children who are overweight or obese.[2] However, although RI ranks well in comparison to the rest of the country, 27% of children age 10-17 are considered overweight or obese. African American and Hispanic children have increased their rates of obesity almost 5-fold.[3] Between age groups, there is a significant jump in prevalence between preschool children and grade school children, suggesting the need for early intervention and prevention measures.

Overweight children have a higher risk of becoming overweight adults,[4] troubling because of the association between obesity and increased risk of cardiovascular changes as well as diabetes mellitus, hypertension and hypercholesterolemia in adulthood.[5] Evidence suggests that the tracking of obesity into adulthood is a strong predictor of adult cardiovascular risk and that overweight children who are overweight adults have worse cardiovascular disease as they age.[6] The rise in obesity has also been linked to the increasing rates of type 2 diabetes being diagnosed in childhood: 45% of the cases of newly diagnosed diabetes mellitus in childhood are Type 2 rather than Type 1.[7] Being overweight has social consequences as well, including, for some children, a lower quality of life,[8] and increased rates of teasing, bullying, and depression.[9] Healthy People 2010 has targeted the reduction of childhood overweight as an important goal for the nation.[10]

Behavioral Factors Associated with Increasing Rates of Pediatric Obesity

A number of factors have led to the growing rates of pediatric obesity. Genetic influences play a role, but the rate at which obesity has increased over a relatively short period of time points also to environmental factors. In the broadest sense, children and adolescents have increased their intake of energy-rich foods while energy expenditure has steadily declined. This has led to an imbalance that favors development of excess weight. More specifically, children and adolescents have increased the time spent in sedentary activities: estimates suggest that children spend greater than 25% of their waking hours in front of the television. [11] Nationally, one study found that 55% of adolescents did not achieve the recommended 60 minutes of moderate to vigorous physical activity per day.[12] In a recent RI study, only 51% of children ages 2-12 years achieved that recommended activity-time.[13]

At the same time, most children and adolescents do not meet the dietary guidelines for 5 or more servings of fruits and vegetables daily. In RI, children 2-12 years of age, on average, only consume 1 ½ servings of vegetables per day.[13] Furthermore, sweet and salty snack foods and sweeteners/sweetened drinks account for almost 1/3 of children's overall energy intake.[14] In addition, changes in eating patterns over the past 20-30 years favor the development of excess weight. Families consume more food outside of the home, which results in increased energy intake due to the higher caloric and fat content in these foods,[15] as well as the larger portions.[15]

Population-Based Approaches for Prevention of Obesity

Prevention of obesity is a long-term objective for reversing the epidemic of pediatric obesity, with increasing focus on policy change. Toward this end, the last five years have seen a significant increase in local, state, and national policy initiatives geared to the prevention and reduction of childhood obesity.[16] At the national level, federal legislation mandates the formation of school district "wellness committees" to improve the nutrition and physical activity environments of schools. Rhode Island has passed two legislative initiatives to promote access to healthier foods in schools: the first eliminates the sale of sugar sweetened beverages; the second requires that all foods in vending machines and sold a ala carte in school cafeterias meet nutrition standards. It is too soon to evaluate the efficacy of these strategies in reducing or preventing pediatric obesity.

Clinical Weight Control Interventions for Children and Adolescents

Policy initiatives are geared towards children and adolescents regardless of weight status, and do not directly address the concerns of children who are already overweight. Considerable numbers of children and adolescents are overweight or obese and need intervention efforts. Treatment approaches that have been most extensively investigated are "lifestyle interventions", focused on developing healthier eating and activity habits that can be maintained long-term. Comprehensive lifestyle approaches typically target changes in diet and physical activity, coupled with behavioral strategies to support implementation. Several reviews address the efficacy of lifestyle intervention for treatment of pediatric obesity[17] as well as recent quantitative analysis of pediatric obesity treatments.[18] We provide here a summary of intervention strategies and supporting evidence.

Lifestyle interventions for children and adolescents who are overweight are often delivered in a group setting and incorporate several common components. These include dietary restriction, physical activity prescription, behavior modification strategies, such as self-monitoring of diet and physical activity, stimulus control strategies, and contingency management, as well as varying levels of parental involvement. Considerable evidence supports the efficacy of comprehensive behavioral weight management interventions with school age children, while fewer studies have been conducted on the efficacy of interventions with adolescents.[19] Decreases of approximately 5% to 20% overweight have been observed in treatment studies with children between the ages of 8 and 12 years immediately following intervention. A recent meta-analysis found that lifestyle interventions demonstrated significant effects in decreasing pediatric obesity when compared to waitlist/no treatment controls or education-only comparison groups.[18]

Randomized behavioral weight control trials targeting adolescents demonstrate variable findings. Treatment studies conducted with adolescents in outpatient settings indicate weight losses ranged from 1-4 kilograms (kg). Some studies have produced much larger losses, although these trials were conducted over 20 years ago and environmental changes have occurred during this time, potentially making weight control more challenging. A randomized trial combining group-based behavioral treatment with one of two different activity interventions (peer enhanced adventure therapy or supervised aerobic exercise) demonstrated an average reduction of 1.75 BMI units across intervention conditions,[16] with no significant differences between groups. A recent review concluded that, despite multiple methodological limitations, comprehensive interventions involving behavioral strategies com-

bined with attention to diet and physical activity showed promise in decreasing adolescent obesity.[17]

Given the increased prevalence of morbid obesity in children and adolescents, intensive interventions have become viable treatment options for morbidly obese adolescents. Treatments provided in residential and inpatient settings[22,23] as well as pharmacotherapy (i.e. sibutramine, orlistat) either used alone or in combination with behavioral approaches show some promise in promoting weight loss.[24,25] Additional research is needed to ensure that pharmacotherapy is a safe and effective alternative for treatment of obesity in adolescents.[3] Finally, bariatric surgery (i.e. Roux-en-Y gastric bypass, gastroplasty, and gastric banding) is increasingly used with severely obese adolescents who have not been responsive to other approaches. However, it is recommended that surgery not be used with children under 13 years of age due to their inability to truly weigh the risks and benefits of such an approach for weight loss. It has also been recommended that bariatric surgery be used with caution in adolescents.[26] For example, more conservative selection criteria than that used with adults, including BMI $\geq$ 40 kg/m^2 and presence of medical comorbidity, is recommended for deciding whether an adolescent is a candidate for surgery.[26]

Ongoing Research to Enhance Treatment for Child and Adolescent Obesity

While there are evidenced-based interventions for treatment of pediatric obesity, there is continued need to improve treatment approaches to enhance weight loss outcomes and maintenance of weight loss. Research conducted at the **Weight Control and Diabetes Research Center (WCDRC)** at the Miriam Hospital and the Warren Alpert Medical School of Brown University targets three areas: 1) the influence of parenting behaviors on changes in eating and activity habits, 2) the role of parents in adolescent weight control efforts, with particular focus on effective communication styles within families, and 3) the role of enhancing sleep duration in children to promote changes in eating patterns associated with healthier weight. Each of these areas will be reviewed below.

We currently have a pediatric weight control research program for overweight children age 5-12 years and their parents. The program teaches parents how to help their children develop healthy eating and physical activity habits. The objective is to identify and enhance parenting behaviors that are key to supporting healthy weight in children.

A second area of research focuses on factors that enhance adolescent weight control efforts. One investigation seeks to identify strategies for parent involvement that maximize weight loss outcomes for adolescents. As part of the program, parents are asked to monitor their own weight control behaviors, as well as to improve communication with their teen, particularly related to eating and physical activity. A second study focuses on identifying weight control strategies of adolescents and young adults who have been successful in losing weight and maintaining that loss. The goal is to use "lessons learned" from successful weight-losers to develop interventions.

A final area of research addresses the potential relationship between obesity risk and children's sleep duration. Research suggests that insufficient sleep is associated with increased risk for obesity in children through its influence on hormones that regulate hunger, appetite, and food intake.[27] However, it is unclear whether improving children's sleep leads to improvements in children's weight status. Two studies at the WCDRC are addressing this question. The first is determining whether increasing sleep duration in children 8-11 years old who sleep 9 ½ hours or less each night is associated with decreased hunger and appetite, decreased reinforcing value of food (i.e. how motivated children are to obtain food), and decreased overall food intake. The second study uses an experimental design to test the same hypotheses. In this study, children 8-11 years old who sleep between 9 and 10 hours per night are asked to sleep their typical amount, increase their sleep by 1 ½ hours and decrease their sleep by 1 ½ hours for one week each. Results will further our understanding of the potential role of sleep duration in the current pediatric obesity epidemic.

Collectively, the research at the WCDRC promises to inform the development of more effective intervention strategies for overweight children and adolescents.

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Adult Behavioral Weight Loss Treatment

Jessica Gokee-LaRose, PhD

In the United States, obesity is the second leading cause of preventable death [1,2] and associated with increased risk of developing hypertension, Type 2 diabetes, cardiovascular disease and death, stroke, as well as a variety of cancers, urinary incontinence, arthritis, and sleep apnea.[3,4] Fortunately, even modest weight loss of 7-10% of body weight among obese individuals can improve blood pressure, high-density lipoprotein-cholesterol, low-density lipoprotein-cholesterol, triglycerides, blood glucose levels, increased cardiorespiratory fitness, and quality of life.[5-8]

The **Diabetes Prevention Program (DPP)**[7] and the ongoing Look **AHEAD (Action for Health in Diabetes)** trial support the benefits of modest weight losses. In DPP, participants with impaired glucose tolerance (or "pre-diabetes") were randomly assigned to receive an intensive lifestyle intervention, pharmacotherapy or placebo. Participants in the lifestyle condition achieved a 7% weight loss at 6 months and maintained a 5% weight loss at 3 years; these weight losses reduced their risk of developing Type 2 diabetes by 58%. The lifestyle intervention was nearly twice as effective as medication in reducing the incidence of diabetes.[7-9] Look AHEAD, an NIH-funded clinical trial, was designed to investigate the impact of weight loss on cardiovascular morbidity and mortality in over 5000 individuals with Type 2 diabetes. Participants were randomly assigned to either a **lifestyle intervention (ILI)** or a **diabetes education and support control (DSE)** group and followed over 12 years. Although long-term data are not yet available, early findings are striking. At one year, ILI participants lost an average of 8.6% of their weight compared to 0.7% in the DSE group, and improvements in mean fitness also were significantly better in the ILI condition.[10] Moreover, these changes were associated with improved diabetes control (i.e. HbA_1c levels) and CVD risk factors (i.e. blood pressure, triglycerides, HDL-cholesterol, and urine albumin / creatinine), and reduced medication use in the ILI group compared to the DSE group. These studies demonstrate that behavioral weight loss interventions consistently produce weight losses of 7-10% of initial body weight and such weight losses are associated with substantial health benefits.

Key Components of Behavioral Weight Control

Behavioral weight loss treatments like those used in DPP and Look AHEAD (also referred to as "lifestyle interventions", or "standard behavioral treatment") focus on changing diet and physical activity to promote weight loss, and emphasize behavioral strategies and skills to implement and maintain these lifestyle changes.[8] The goal is to produce a 10% reduction in body weight, with a weekly goal of between 0.5-1.0 kg / week.[8] Treatment programs are relatively standard and are administered in a closed group format using treatment manuals; the sessions are typically led by behavioral psychologists, dieticians, and/or exercise physiologists and include structured lessons on nutrition education, physical activity, and behavioral skills. Groups have somewhere between 10 and 20 patients and meet for 60-90 minutes weekly for 20-24 weeks; many programs also offer biweekly or monthly sessions for another 20-52 weeks because continued contact and accountability is associated with better long-term weight loss.[11] Decades of research have identified several areas that are essential to long-term weight control, including a calorie restricted diet, engaging in high levels of physical activity, and self-monitoring of key behaviors.

Dietary Prescriptions

Most behavioral programs emphasize a moderately restricted calorie diet based on the participant's initial body weight; i.e., 1200-1500 calories, and 30% calories from fat. Initially, a sample meal plan is often provided. Nutrition lessons focus on label-reading and portion control, as well as education about energy balance and how to make healthy food choices while staying within the calorie prescription. Participants are encouraged to use meal replacement products such as low calorie frozen entrees, meal replacement bars and shakes, as well as other pre-portioned packaged foods (e.g., yogurt, individual packets of oatmeal). The use of such products lets participants track calories throughout the day without having to weigh and measure foods.

Physical Activity

Physical activity is one of the best predictors of longer-term weight control, and is a critical element of behavioral programs, particularly in the maintenance phase. In standard programs, participants are instructed to increase their physical activity gradually until achieving at least 200 minutes per week in moderate intensity activity (i.e. at least 40 minutes a day 5 times per week). Participants are encouraged to do an activity similar to brisk walking and are allowed to accumulate time spent in multiple short bouts of activity (at least 10 minutes in length). Many behavioral programs give participants pedometers or encourage them to purchase pedometers, with the goal of achieving at least 10,000 steps per day.

Data from the **National Weight Control Registry (NWCR)**, a self-selected group of over 5000 adults who have on average lost over 70 pounds and maintained it almost 6 years, suggest that levels of physical activity much higher than typically prescribed may be necessary to sustain long-term weight loss. On average, NWCR members reported expending approximately 2800 kcal/week,[12] - markedly higher than the 1000 kcal/week typically prescribed in standard behavioral weight loss programs. This translates to roughly 60-90 minutes of moderately intense PA on 6 days / week, and is consistent with the 60-90 minutes of daily activity recommended in recent public health guidelines for the *maintenance* of weight loss.[13] In a recent randomized clinical trial, Jeffery and colleagues[14] compared the effects of a moderate (i.e. 1000 kcal/week) versus a high (i.e., 2500 kcal/week) exercise prescription within a weight loss program; those in the high exercise group achieved better long-term weight losses at 12 and 18 months.

Self-Monitoring

Self-monitoring is an essential component of behavioral weight loss and has been associated with successful long-term weight loss.[15-16] Participants are instructed to keep detailed records of their dietary intake, including the calories and fat grams in all foods and beverages they consume, as well as their minutes of structured activity and their weight. A food diary increases patients' awareness of their food choices and highlights problematic eating patterns. Programs that provide pedometers ask participants to record the number of steps they take each day in their diary. At the end of the first week, the days are averaged and participants are encouraged to add 250 steps per day each successive week, until reaching 10,000 steps per day.

Recent studies support frequent self-monitoring of weight.[12,17-18] In fact, 44% of NWCR members reported weighing themselves daily,[12] and more recent findings with registry participants indicate that decreased frequency of self-weighing is independently associated with greater weight regain over time.[19] Within standard programs, patients are instructed to self-monitor their weight at least weekly and no more than once per day. The scale provides participants with information about the effects of eating and exercise behaviors and serves as a cue for action. When their weight is in the desired range, we encourage patients to reward themselves in some small way (e.g., a new book). If their weight is not within the desired range, we encourage patients to make additional changes in their behaviors.

Other Key Behavior Modification Skills

Stimulus control: Patients are taught to reduce the cues that prompt eating and increase the cues that encourage physical activity. For example, patients are instructed to reduce the visibility of high fat foods in the home and increase the visibility of cues for exercise, such as sneakers or work-out equipment.

Problem-solving: Patients are taught to deal with situations that make it difficult to reach healthy eating and activity goals.

Goal setting: The importance of both short- and longer-term goal setting is emphasized in behavioral weight control. Daily and weekly goals for eating and activity behaviors and weight loss are encouraged, and patients are taught to set these goals using the S.M.A.R.T. principle: specific, manageable, attainable, realistic, and time-limited.

Social support and assertiveness training: Patients are taught the importance of developing and maintaining social support for behavior changes made during the program, and are encouraged to access support both within the group and in their home and work environments. Furthermore, patients learn how to assert themselves in social situations as it relates to eating and activity.

Cognitive restructuring: Patients are taught how to identify and modify maladaptive thoughts that may contribute to overeating and physical inactivity. For example, negative thoughts can take the form of dichotomous thinking (e.g., "If I'm not able to exercise for 45 minutes, I might as well not do it at all") and rationalization (e.g., "It's been a really tough week, I deserve to eat whatever I want tonight"). Patients are taught to identify their own thinking patterns and challenge / replace negative thoughts with more realistic / adaptive statements.

Relapse prevention: Based on Marlatt and Gordon's theory of relapse,[20] behavioral programs emphasize that slips are a natural part of the weight loss process, and we teach patients to anticipate problematic situations and plan strategies for coping with these situations.

Research at the Weight Control and Diabetes Research Center

At the **Weight Control and Diabetes Research Center (WCDRC)**, our primary aim is to develop methods for the prevention and treatment of obesity and related medical illnesses. We provide services to members of the community free of charge through our ongoing clinical trials. Currently, we are working to improve upon existing treatments: 1) by targeting high-risk groups and tailoring treatment to them; 2) by modifying the home environment; 3) by adding individual sessions as an adjunct to group treatment; and 4) by testing different dietary prescriptions. Ongoing studies in these areas are described briefly below.

Targeting High Risk Groups

Young adults are at particularly high risk for weight gain and obesity. The average weight gain that occurs between the ages of 18 and 35 is 30 pounds, and the largest gains tend to occur among those who are already overweight. Despite increased risk, young adults are typically underrepresented in standard treatment programs and little is known about what treatments will be most effective with this age group. We recently conducted a pilot study in which we targeted young adults between the ages of 21 and 35. ***Live Well*** was a brief (10-week) program tailored to address problem areas of particular relevance to young adults, such as fast food, alcohol and sweetened beverage consumption. In preliminary findings, participants achieved significant weight losses at post-treatment, and on average, maintained those losses at 10-week follow-up. Frequent weighing was associated with greater magnitude of weight loss at follow-up, suggesting that, similar to older adults, self-weighing may be an important weight control tool for this age group. Additional studies designed to improve recruitment and treatment success for young adults are in the planning stages.

[*Latinos are at increased risk for obesity, and studies designed to treat this group are also ongoing at the WCDRC. See the Marquez, Leahey, and Wing article in this issue for details.*]

Modifying the Home Environment

One of the central tenets of adult behavioral weight control is that cues in the environment are important determinants of

Table 1. Key Components of Adult Behavioral Weight Loss Treatment

Dietary Prescriptions
- Low calorie, low fat diet
- 1200-1500 calories per day, depending on initial weight
- No more than 30% calories from fat

Physical Activity Prescriptions
- Gradually build up to at least 200 minutes / week of structured activity
- Emphasis on moderate intensity aerobic activity (e.g., brisk walking)
- Increase lifestyle activity (e.g., take stairs instead of elevator)
- Aim to exercise at least 5 of 7 days each week

Self-Monitoring
- Keep detailed food records
- Track minutes of structured activity
- Wear a pedometer and work toward goal of 10,000 steps daily
- Weigh frequently (no more than once per day)

Other Behavioral Skills
- Stimulus control
- Goal setting
- Problem solving
- Cognitive restructuring
- Social support and assertiveness training
- Relapse prevention

behavior. An ongoing randomized clinical trial focuses on helping participants modify their home environments. In ***Lifestyle Eating and Activity Program (LEAP)*** , an 18-month behavioral program, participants are randomized either to a standard care group or a modified home environment group. Participants in the *LEAP at Home* group receive help with making physical modifications to their homes (e.g., exercise equipment and serving / measuring equipment are provided if not readily available) and also have a support partner from their home (e.g., spouse, child) who attends all group meetings and actively engages in the weight loss program with them.

Incorporating Individual Sessions as an Adjunct to Group Treatment

Group obesity treatment has been shown to produce greater weight losses than individual treatment, and is as effective in improving psychological functioning as well; therefore, standard programs are conducted in a group format. However, those individuals who do not experience early success in standard programs (i.e. not meeting weekly weight loss goals during the early weeks of treatment) tend not to fare as well over the course of the program. We are currently conducting a randomized trial to examine whether providing individual "getting back on track" sessions for participants will improve their overall weight loss. In the ***Strive for 5*** program, participants are randomized to either a standard behavioral or modified program; participants in the modified program will receive brief individual sessions instead of attending group meetings when they are not meeting their weekly weight loss goals.

Testing Different Dietary Prescriptions

Another trial is examining the effect of limiting snack foods ("junk foods") that are usually high in fat and calories, with few nutrients. A diet that has many different types of these foods is also usually high in calories and fat, which makes it hard to lose weight. In the ***Healthy Habits*** study, participants are randomly assigned either to an 18-month standard program or to a program in which they are instructed to specifically limit the number of different snack foods they consume to two, as a way of helping them stay within their overall calorie and fat prescriptions.

Studying Other Health Problems that May Improve with Weight Loss

The WCDRC has been involved in several other studies examining the health benefits of modest weight losses. For example, overweight women often have trouble with urinary incontinence. We have shown that modest weight losses of 5-10% can improve this problem. Recently, considerable attention has been focused on liver problems, including **non-alcoholic steatohepatitis (NASH)**, that can occur with obesity. We have demonstrated that modest weight losses can improve these problems.

A new research area at the Center involves the impact of weight loss on migraine headache frequency and severity. Recent population-based studies indicate that individuals with migraine who are also obese may be at elevated risk for more frequent and disabling headaches. To date, no studies have examined whether weight loss may contribute to reduction in headache activity among overweight and obese migraineurs.

Finally, men who are overweight and / or sedentary have been found to have an increased risk of problems with erections. The WCDRC is planning a trial to determine whether weight control can improve health and quality of life.

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Maintenance of Long-Term Weight Loss

J. Graham Thomas, MS, and Rena R. Wing, PhD

A key problem in the area of weight control is the maintenance of weight loss. Behavioral treatment programs are able to consistently produce weight losses of 7 – 10% of initial body weight at the end of 6 – 12 months of treatment. However, even with ongoing contact, clients often regain the weight, a finding documented by the Diabetes Prevention Program. [1]

What makes weight loss maintenance so difficult? Physiological changes which occur during weight loss can promote weight regain; e.g., decreases in metabolic rate, increases in catecholamine excretion and thyroid function, increase in ghrelin, and increases in lipoprotein lipase activity. Psychological and behavior changes are also related to weight regain. People may become bored on restricted diets and more responsive to palatable foods and social cues that pressure them to eat more and exercise less. Finally, dieters' motivation may decrease after an initial weight loss; clothes fit better, health may have improved, and the psychological effort or "costs" of adhering to a weight loss regimen may come to outweigh the benefits.

Two approaches have been used to better understand the behavioral factors associated with weight loss maintenance and regain. One approach is to study those who have been successful at long-term weight loss maintenance. The other approach is to conduct randomized trials evaluating specific approaches to improve long-term weight loss. Both of these approaches are discussed below.

The National Weight Control Registry

In 1994 Drs. Rena Wing and James Hill founded the **National Weight Control Registry** (**NWCR**) to identify a large sample of individuals who were successful at long-term maintenance of a substantial weight loss (i.e. "successful weight losers"). The NWCR recruits members who are 18 years-old or older, and have maintained a weight loss of at least 30 lbs. for at least one year. Registry members are assessed yearly via questionnaires that tap both physiological and psychological constructs, including eating habits, activity patterns, and weight control strategies. The NWCR has more than 6,000 participants enrolled to date.

The NWCR members are predominately female (77%), college educated (82%), Caucasian (95%), and married (64%). Before losing weight, the average NWCR member had a **Body Mass Index** (**BMI**) of 36.7, which is in the obese range (a BMI of greater than 25 is considered overweight, greater than 30 is considered obese). Upon entry to the NWCR, the average member had lost 74.0 lbs., which reduced her BMI to 25.2, near the normal weight range. [2] Although the registry is relatively homogeneous in terms of gender, ethnicity, and socioeconomic status, efforts are being made to diversify the sample in the hope that future reports will be able to explore differences among these subgroups.

Weight Loss Strategies

NWCR members share a history of successful weight loss, which was most frequently achieved by using a combination of dietary change and increases in physical activity (89% of the sample). Far fewer changed only their diet (10%) or their activity level (1%). Less common strategies included the use of liquid meal replacements (13.8%; e.g., SlimFast), weight loss medications (6.2%), and surgery (2.4%). While diet and physical activity were clearly the most common strategies, the specific techniques used were highly variable. [3]

Within the general category of dietary change, the three most common weight loss techniques included limiting intake of foods associated with weight gain (e.g., sugary and fatty foods like deserts), decreasing the quantities of all foods eaten, and counting calories. These strategies were practiced by registry members on their own (44.6%), as well as in formal programs (55.4%) such as Weight Watchers, Overeaters Anonymous, and individual sessions with a psychologist or registered dietician.[4]

Registry members who used physical activity as part of their weight loss effort almost always exercised at home (92%). A sizable minority exercised regularly with a friend (40.3%) or in a group (31.3%). Most members engaged in one or two types of activity, with walking and aerobic dancing more common in women, and competitive sports and weightlifting more common in men.[4]

Successful weight loss is associated with a variety of benefits among registry members.[4] Almost all participants (95.3%) show increases in quality of life, which is a general measure of well-being that incorporates physical and psychological aspects. Weight loss tends to improve energy and mobility for most registry members (92.4%), making physical activity a more likely possibility. Mood also improves for the majority of weight losers, with 91.4% reporting decreases in depressive symptoms. Of course, the physiological benefits of weight loss are well documented, with decreases in hypertension, type II diabetes, heart disease, and cancer.

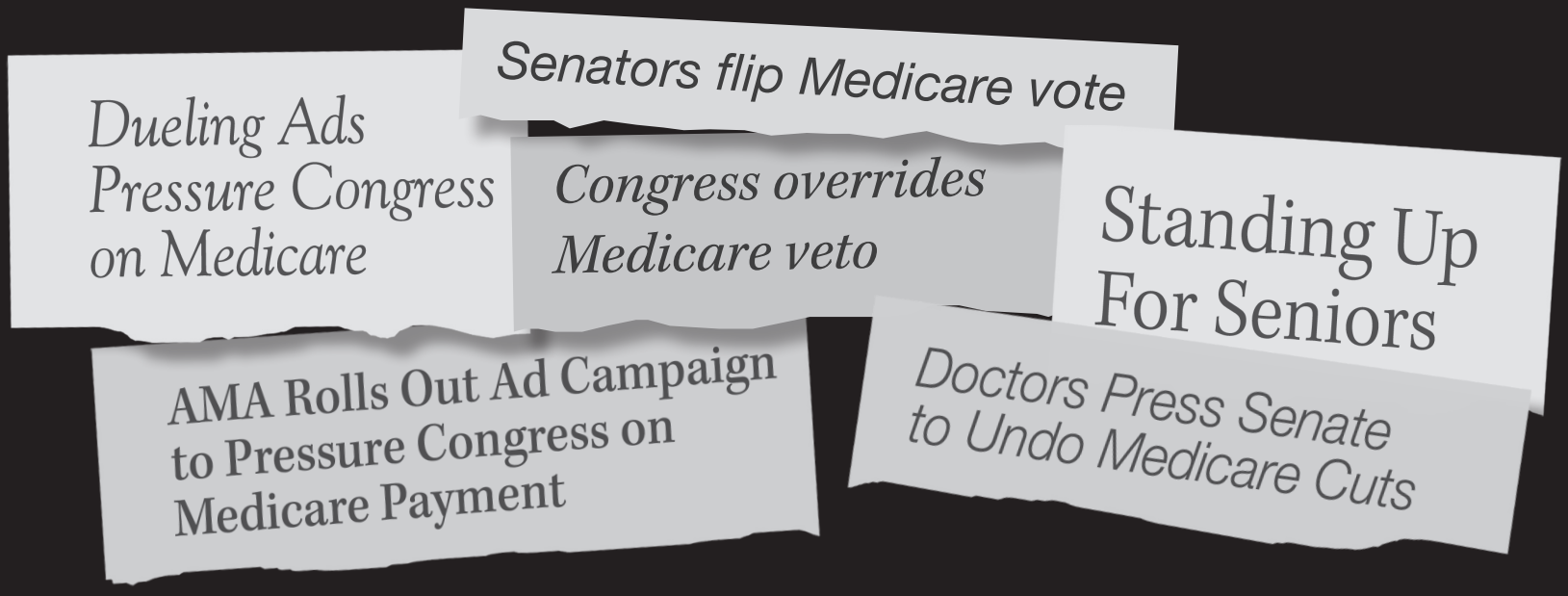
Weight Maintenance Strategies

Despite the variable methods used to lose weight, most NWCR members used the same few strategies to maintain their weight loss. These strategies fall into three categories: eating habits, self-monitoring, and physical activity.

The eating habits of successful weight losers are characterized by a low daily caloric intake of about 1,385 k/cal per day and a low percentage (24%) of calories from fat.[5] These values may reflect the fact that the majority (55%) of registry members are still trying to lose weight. Additionally, the underreporting of caloric intake is well documented, especially in overweight individuals.[6] Furthermore, those who recently entered the registry report somewhat higher dietary fat intake (29%), probably reflecting the popularity of low carbohydrate diets.[7]

Also, registry members try to eat regularly and avoid situations that encourage overeating. The average registry member eats several times throughout the day (M = 4.87).[5] For most members (78%), one of these meals is breakfast.[8] Most meals are prepared at home. In contrast to the majority of Americans, registry members rarely eat fast food (on average less than one meal per week (M

(Actual headlines in support of AMA's efforts)



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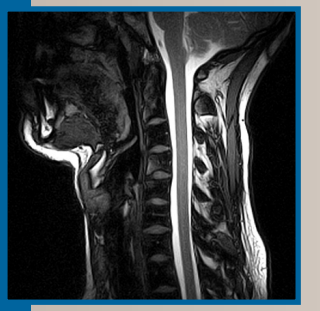

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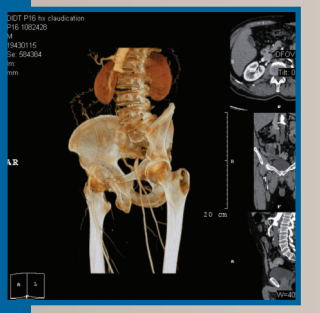

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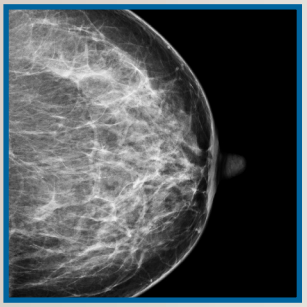

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= .74)).[5] In total, Registry members eat outside of the home an average of only 3 times per week. Furthermore, the members who are most successful at maintaining their weight loss tend to have very little variety in their diet, and do not "splurge" on high calorie foods on holidays or weekends.[9]

Self-monitoring is another important aspect of weight maintenance efforts. Over 75% of registry members weigh themselves more than once per week, and 50% count calories and/or fat grams.[5] Registry members also score highly on the Cognitive Restraint subscale of the Eating Inventory, which is related to the amount of mental effort that is spent on weight control.[3]

Finally, registry members are notable for their physical activity.[3] Walking is the most common exercise (76.6% of participants), followed by weight lifting (20.3%) and cycling (20.6%). The average successful weight loser reports engaging in a level of physical activity that is equivalent to about one hour of moderate intensity physical activity, such as brisk walking, per day. This is considerably more than the minimum recommendations proposed by the Surgeon General's report. The time spent on physical activity likely comes at the expense of more sedentary activities. The average registry member tends to watch only 6 to 10 hours of television per week,[10] in stark contrast to the average American adult, who spends an average of 28 hours per week watching TV.[11]

Predictors of Weight Maintenance

The average registry member devotes a substantial amount of time and energy to behaviors aimed at weight control. Fortunately, the most successful registry members report that it becomes easier to maintain a weight loss over time.[12] Nevertheless, weight regain sometimes occurs. This failure to maintain weight loss is most often associated with a lapse in the weight control strategies described above.

At one year follow-up, the majority of members either maintained their weight loss (59%) or lost additional weight (6%). However, 35% gained 5 lbs. or more, with an average weight gain of 15.5 lbs..[2] Compared to those who maintain their weight loss, members who regained weight tended to have a shorter duration of weight loss maintenance (i.e., less than 2 years), less dietary consistency, more fast food consumption,[2] more TV viewing,[10] and less frequent breakfast consumption.[8] Weight regainers are also characterized by higher levels of depressive symptoms and dis-inhibited eating, which is a failure to maintain control over eating.[2]

These findings demonstrate that successful weight loss and weight maintenance is possible, but requires sustained effort, especially in the early stage of weight maintenance, when regain is most likely.

Can we teach these strategies?

Can we teach these strategies to others who have recently lost weight and help them with their weight loss maintenance? To address this question, Wing and colleagues conducted a study called STOP Regain.[13] A total of 314 participants who had lost at least 10% of their body weight within the past 2 years were recruited. Recent weight losers were selected because these individuals are at greatest risk of regain. These participants had lost weight in a variety of ways including through commercial programs, liquid formula diets, or on their own. On average, these participants were 51 years of age, had lost a mean of 19.3 kg or almost 20% of their body weight within the past 2 years, and currently had a BMI of approximately 29.

Participants were randomly assigned to one of three groups: a control group, a group that received a face-to-face intervention, or a group that received an Internet intervention. The two interventions were comparable in content and frequency of contact. Both involved 4 weekly meetings followed by monthly meetings for a total of 18 months of follow-up. The intervention was based on a self-regulation model, in which participants were taught to weigh themselves daily and to use the information from the scale to know when changes in diet and physical activity behaviors were needed. The program helped them learn about the eating habits of the NWCR members, and emphasized, for example, the importance of eating breakfast, the need to be vigilant about dietary choices, and the day-to-day consistency observed in NWCR members. In addition, participants were taught to gradually increase their level of physical activity, so that they were eventually doing 60-90 minutes a day of moderate intensity activity, again similar to registry members.

The STOP Regain program was effective in preventing weight regain, especially when it was offered in the face-to-face format. Over the 18 month trial, participants in the control group regained 4.9 kg on average, and the Internet participants regained 4.7 kg. In contrast, the face-to-face group regained only 2.5 kg, significantly less than either of the other groups. The percent of participants who regained 5 lbs or more over the 18 months was significantly higher in the control group than in the face-to-face or Internet groups (72.4% vs 45.7% and 54.8% respectively). The greater benefit of personal contact compared to Internet approaches was confirmed in another maintenance trail.[14]

Of particular note was the STOP Regain finding that self-weighing frequency increased in the Internet and face-to-face groups, while it remained unchanged in the control. Moreover, those who weighed daily in the Internet and face-to-face groups had less risk of regaining weight than those who weighed less frequently. The same effect was not observed in the control group. This finding suggests that it was not the frequency of weighing per se that affected weight regain, but rather weighing frequently and using the information from the scale to self-regulate behavior.

Key behaviors associated with weight loss maintenance

Both STOP Regain and other studies of weight loss maintenance have identified a cluster of behaviors and psychological variables that are associated with improved long-term maintenance of weight loss. In particular, high levels of physical activity have consistently been shown to lead to improved long-term outcomes. Jakicic et al.[15] demonstrated that women who maintain activity levels of over 200 minutes per week are best able to maintain their weight losses. Moreover, high levels of dietary restraint are associated with better maintenance of weight loss.[16] Restraint, as measured by the Eating Inventory,[17] includes strategies such as deliberately taking small helpings, avoiding certain foods, and counting calories; these are all key behav-

iors accented in behavioral weight loss programs. In contrast, those who report higher levels of depressive symptomatology or disinhibition (difficulty controlling overeating) have in some studies been shown to be more likely to regain weight. Efforts are needed to develop ways to modify these psychological variables.

Efforts at the Weight Control and Diabetes Research Center

The National Weight Control Registry has provided important information about the behaviors of successful weight loss maintainers and STOP Regain has shown that teaching these strategies can help to improve weight loss maintenance.

Efforts are underway to increase the number of ethnic minority members in the registry, to better understand the strategies used by African American and Hispanics who are successful weight loss maintainers. In addition, a new Teenage National Weight Control Registry is being developed. Those who are age 14-20 and have lost at least 20 pounds are encouraged to join. This registry will provide important information about what motivates young adults to lose weight and what role parents and friends can play in these efforts.

The Center is also studying strategies that may help individuals who have lost weight maintain their success. Since staying in close contact with participants appears important for weight loss maintenance, we are investigating ways that we can maintain on-going contact using new technological approaches, rather than requiring face-to-face visits. We are also studying ways to motivate individuals to not only initiate behavior change, but also to stay with it long-term.

Conclusions

Maintenance of weight loss is crucial to the control of weight. The WCDRC is addressing this problem by studying those who have succeeded at weight loss maintenance and developing programs that teach maintenance strategies to those who have recently lost weight.

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Bariatric Surgery for Severe Obesity: The Role of Patient Behavior

Dale Bond, PhD, Tricia M. Leahey, PhD, Siva Vithiananthan, MD, and Beth Ryder, MD

In the United States, 34% of adults were obese (BMI ≥ 30 kg/m^2) in 2005-2006.[1] Of particular concern is the rapid increase within the most extreme weight categories, resulting in the heaviest individuals becoming heavier.[1,2] The prevalence of severe obesity, defined as BMI ≥ 40 or approximately ≥ 100 lbs. overweight, increased by 50% from 2000 to 2005, with 1 in 20 Americans now severely obese.[2] Severely obese individuals, compared to those who are less overweight, have higher rates of obesity-related comorbidities and higher health care expenditures, compared to those who are less overweight.

Bariatric Surgery as a Treatment for Severe Obesity

The increasing prevalence of severe obesity coupled with its lack of responsiveness to conventional weight control approaches has intensified the demand for bariatric surgery. In 1991, when the National Institutes of Health established guidelines for surgical treatment of severe obesity, fewer than 5,000 bariatric operations were performed in the US.[3] According to the American Society for Metabolic and Bariatric Surgery, 210,000 procedures were performed in 2007.[4]

The spike in patient interest in bariatric surgery can also be attributed to the advancement of laparoscopic (minimally invasive) techniques, which have replaced open surgery as the preferred surgical approach because they reduce complications, discomfort and duration of hospital stay.

Bariatric surgery procedures

Bariatric surgery encompasses several different procedures (Figure) that produce weight loss primarily through gastric restriction and/or intestinal malabsorption. **Roux-en-Y gastric bypass (RYGB)**, which utilizes both mechanisms, is the most commonly performed procedure in the US today. The operation creates a one to two tablespoon sized stomach pouch that restricts oral intake. This pouch connects to an intestinal limb that reroutes food so that fewer calories are absorbed by the body. The majority of RYGB patients experience rapid weight loss, losing approximately two-thirds of their excess weight, defined as body weight in excess of ideal body weight, within the first 1-2 years postoperatively.[4]

Laparoscopic adjustable gastric banding (LAGB), long popular outside the US, has quickly risen in popularity in this country since its approval by the **Food and Drug Administration (FDA)** in 2001. This restrictive operation places a synthetic band around the upper stomach. The band can be adjusted via a subcutaneous port to limit oral intake. To date, only one randomized controlled trial has compared outcomes following LAGB and RYGB, showing greater **percent excess weight loss (EWL%)** among RYGB patients (66.6%) than LAGB patients (47.5%) at 5 years postoperatively.[5]

In addition to RYGB and LAGB, newer procedures such as **laparoscopic sleeve gastrectomy (LSG)** are increasingly used for super-super-obese patients (BMI ≥ 60) and those patients with severe comorbidities who are at greater risk for perioperative morbidity and mortality.[6] LSG is a less technically demanding operation, thereby limiting duration of general anesthesia. It involves removing 80% of the stomach and creating a narrow tube-like conduit along the lesser curvature, thereby restricting food intake. LSG is shown to produce weight loss that is comparable to LAGB at 1 year.[7] For some high-risk patients, a two-staged operation may be performed in which the safer LSG procedure is conducted first to promote initial weight loss and reduce difficulty and risk inherent to a second surgery that is performed, either RYGB or **bilio-pancreatic duodenal switch (BPDS)**. The BPDS procedure involves bypassing the sleeve stomach to the distal portion of the small intestine to limit nutrient absorption.

Bariatric surgery outcomes

Overall, bariatric surgeries represent the most effective and durable weight loss option for severely obese individuals.[8] Depending on the procedure, patients typically lose between 20 and 50 kg within the first 1-2 postoperative years, and maintain the bulk of this weight loss for up to 10 years and longer.[4,8] Along with effective weight control, bariatric surgery procedures result in complete or partial resolution of several obesity-related comorbidities, most notably type 2 diabetes.[8-10] Successful surgical weight loss and maintenance are also associated with substantial long-term improvements in **health-related quality of life (HRQoL)**.[11] Finally, recent long-term data provide evidence that bariatric surgery contributes to significantly reduced risk of overall and disease-specific mortality.[12,13]

Suboptimal bariatric surgery outcomes

While bariatric surgery reliably produces rapid and large weight losses, up to 25% of patients fail to achieve adequate weight loss, typically defined as ≥ 50% excess weight lost and maintained for at least 5 years after surgery. Other patients regain substantial amounts of weight, even within the first 1-2 years after surgery.[14] These less successful patients will see less improvement in HRQoL and reduced reversal of medical comorbidities. In addition, these patients may seek conversion to another procedure, increasing technical-related surgical demands and decreasing cost-effectiveness.

The role of patient behavior in bariatric surgery outcomes

The variability in surgical weight loss outcomes may largely be attributed to patient behavior. Many patients have difficulty complying with postoperative recommendations regarding eating and activity. A rapidly growing body of research devoted to behavioral aspects of bariatric surgery suggests that failure to change problem eating behaviors and patterns of inactivity can undermine weight loss outcomes.

Eating behaviors and surgical outcome

Pre-surgical binge eating, the uncontrollable consumption of a large amount of food in a discrete period of time accompanied by psychological distress, is prevalent among bariatric surgery patients and has been shown to be a negative indicator of post-surgical weight loss.[15,16] Furthermore, individuals who engage in binge eating prior to surgery tend to "graze" (frequently consuming small amounts of food over an extended period of time) following surgery, which is

associated with less post-surgical dietary restraint and poorer post-surgical weight loss.[17] Finally, post-operative loss of control while eating is associated with less weight loss, greater caloric intake, and greater percentage of calories from fat.[17] These studies suggest that effective treatment of bariatric surgery patients' maladaptive eating behaviors is imperative to promote optimal postoperative weight loss.

To date, only one intervention targeting maladaptive eating behavior has been conducted. Leahey and colleagues (in press) used cognitive-behavioral and mindfulness techniques to reduce binge eating and associated loss of control while eating in post-surgical bariatric surgery patients. The intervention consisted of ten consecutive weekly group sessions. During the sessions, participants were encouraged to use cognitive restructuring techniques to alter thoughts associated with maladaptive eating behavior, increase awareness of satiety and external eating cues, modify environmental cues to reduce overeating, and improve coping skills. The intervention was found to substantially reduce binge eating/loss of control while eating (d=1.47); from pre- to post-intervention, average number of weekly episodes were reduced from 2.25 to 0.10. Post-surgical weight loss also improved. Before the intervention, participants' average deviation from expected weight loss following bariatric surgery (per NIH guidelines) was +12.29-lbs. After treatment, participants' deviation from expected weight loss was reduced to +6.43-lbs. These results suggest that a behavioral intervention is effective at treating maladaptive eating behavior and improving weight loss in post-surgical bariatric surgery patients. Future studies ought to continue to investigate the effects of behavioral interventions on maladaptive eating behavior and examine the efficacy of these interventions using randomized controlled trials.

In addition, research is needed to better understand the impact of different bariatric surgery procedures on hunger and satiation. At the **Weight Control and Diabetes Center (WCDRC)**, The Miriam Hospital, researchers are measuring changes in hunger and satiation following RYGB and LAGB. Hunger is assessed using the relative-reinforcing value of food, a computerized behavioral-choice paradigm that assesses how motivated a person is to work for food versus a non-food alternative. This measure has been validated in both normal-weight and obese individuals with both groups showing greater motivation to work for food when hungry.[18] Satiation is assessed by measuring the rate at which physiological (i.e. salivary) responding declines or *habituates* to repeated presentations of a taste stimulus.[19] Theoretically, the quicker one habituates to the sensory properties of a food, the quicker that consumption of that food will be terminated or the eating episode will come to an end, providing an objective measure of satiation. Subsequent studies will examine whether changes in hunger and satiation using these measures predict rate and amount of postoperative weight loss.

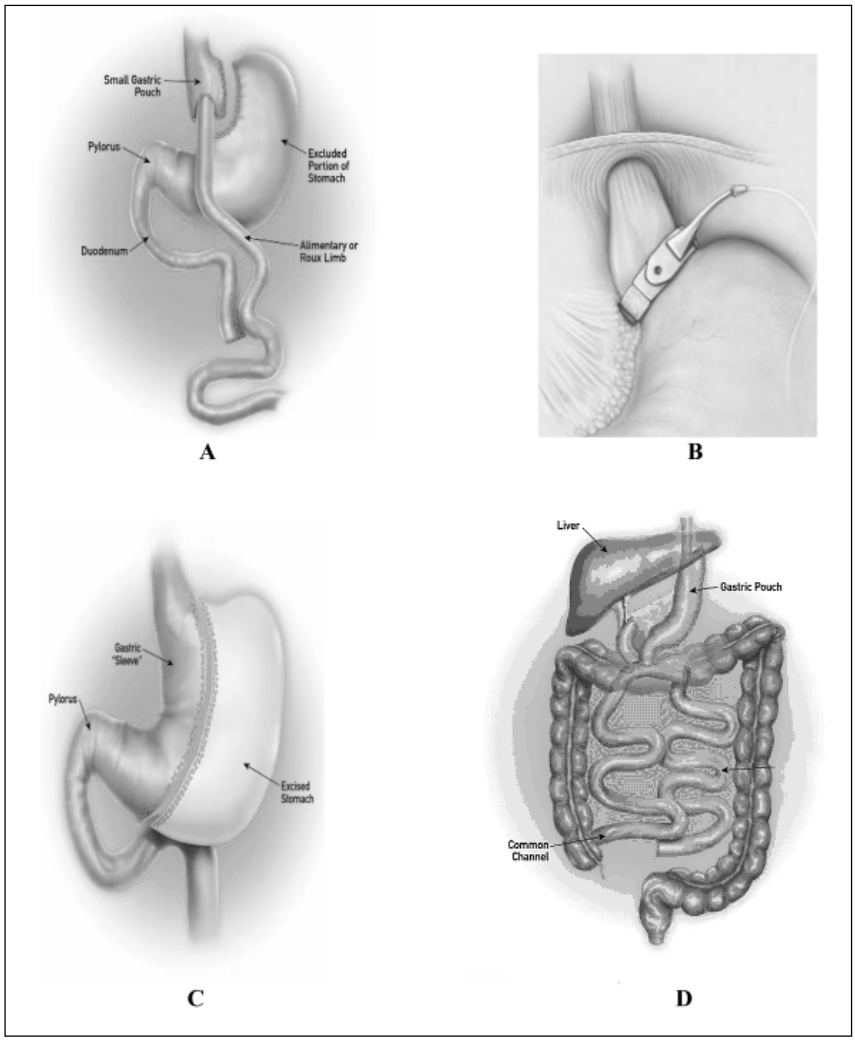

FIGURE. A. Roux-en-Y gastric bypass; B. Laparoscopic adjustable gastric banding; C. Laparoscopic sleeve gastrectomy; D. Biliopancreatic duodenal switch
With permission from Ethicon Endo Surgery.

Physical Activity (PA) and Surgical Outcomes

PA can be defined as any bodily movement that results in **energy expenditure (EE)**. Total energy expenditure encompasses posture, spontaneous and voluntary physical activity, resting metabolic rate, and energy needed for digestion and absorption of food. The largest and most variable component of EE is PA. An increasing number of studies suggest that the amount of energy that bariatric surgery patients expend through PA can influence weight loss outcomes.[20-22] A recent cross-sectional study showed that patient-reported engagement in < 150 minutes per week of moderate to vigorous intensity PA was associated with poorer weight loss at 6-months and 1-year after RYGB after adjusting for differences in age and preoperative BMI.[20] In addition, recent prospective studies suggest that pre- to postoperative changes in PA may influence amount of weight loss attained.[21,22] In one study, smaller reported pre to postoperative increases in leisure-time PA were associated with smaller weight losses at 1 year after LAGB.[21] In another

study, RYGB patients who reported being inactive (< 200 min/wk) preoperatively and progressed to being physically active (= 200 min/wk) postoperatively achieved weight losses that were greater than those experienced by patients who remained inactive and comparable to those attained by patients who continued being active.[22] These studies suggest that the magnitude of pre- to postoperative increase in PA may be important for augmenting the amount of weight loss attained during the first postoperative year.

Despite consistency in findings across these studies, the accuracy and clinical implications of the findings are unclear given limitations inherent to self-report instruments, most notably recall bias. To improve upon these studies, researchers at the WCDRC are using accelerometers and other objective monitoring devices to assess and quantify postoperative PA changes among patients undergoing RYGB and LAGB. Accelerometers are small, motion sensing devices worn on the hip that can detect acceleration and deceleration in one or more directions of movement. The minute-by-minute data obtained from these devices allows for assessment of intensity and duration of PA throughout the day and provides an objective measure of caloric expenditure that is shown to correlate with more intensive and expensive measures such as doubly-labeled water.

Behavioral interventions to increase PA, although shown to be effective in a variety of populations, have not yet been applied to bariatric surgery patients. Moreover, it is not clear which is the best approach to increase PA in this population. Promoting regular walking is a typical approach used to increase PA among inactive individuals. Walking interventions, particularly those that incorporate pedometers and additional behavioral strategies (e.g., self-monitoring step counts, goal setting, etc.), produce significant increases in time spent being active. These increases are also shown to result in health benefits and modest weight losses.[23] However, while most bariatric surgery patients are physically able to walk, their engagement in such activity for any extended duration or at higher intensities may be limited by discomfort and fatigue due to high biomechanical loads and greater cardiorespiratory and energy demands. Consequently, interventions to promote walking and other planned PA among surgery patients may need to account for these limitations—e.g., prescribing walking in multiple short bouts versus a single continuous bout and encouraging patients to walk slower on a flat surface.[24,25]

Another approach to increasing PA that could prove easier for bariatric surgery patients to adopt is reducing sedentary behaviors (e.g., TV watching). Obese individuals allocate a larger proportion of their time to being sedentary compared with lesser weight individuals.[26] Consequently, reducing sedentary behaviors could result in more frequent opportunities for bariatric surgery patients to engage in both lifestyle and planned PA. No study, however, has tested the impact of reducing sedentary behaviors on PA among bariatric surgery patients.

Conclusion

With the exception of bariatric surgery, severely obese individuals have few effective weight control options. Bariatric surgery produces large weight losses which are shown to be maintained for 10 years and longer, although some patients do not achieve adequate weight loss and others experience considerable weight regain. These outcomes are increasingly attributed to variability in patient compliance with pre- and postoperative behavioral recommendations, particularly those related to eating and activity habits. Observational research suggests that both problematic eating and low PA are associated with poorer weight loss. Administering behavioral interventions to target such behaviors within the context of a comprehensive surgical program may improve surgical outcomes.

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EDITED BY ANA TUYA FULTON, MD

Cancer Screening Over 65

Kenneth D. Bishop, MD, PhD

MS is a 68-year-old woman with a medical history of hypertension, type 2 diabetes managed with insulin, and osteoporosis. She comes to the primary care clinic for follow up and medication refills. She has been your patient for 18 months, since she moved to the United States with her son, daughter-in-law, and their children from the Dominican Republic. She is adherent with her anti-hypertensive medications but is less enthusiastic about measuring her blood glucose levels and explains that she would rather have high sugar levels than risk the shakiness of hypoglycemia. She remembers that her most recent Pap smear was within the past five years and thinks "it may have had some problems" but is unable to provide more detail. She did not bring her medical records with her when she moved, and wants to know if you think she should have a Pap test today.

The benefits of screening for cancer are clear. Without even considering the immeasurable personal cost of a cancer diagnosis, the expense associated with many current treatment regimens makes early diagnosis paramount to managing finite health care resources and to improve chance of meaningful recovery. One difficulty in designing guidelines for screening is to determine who would, and who would not, benefit from the treatment that follows a positive screening test result. The additional challenge is that there has also been harm demonstrated in patients who have a false positive test result, either due to unnecessary procedures or treatments, or due to psychological impact. Furthermore, everyone reaches an age (chronologic or functional) when potential treatments could cause more suffering than the natural course of the disease.

For the primary practitioner, there are a paucity of guidelines to inform appropriate screening in patients over 65, as ideas of life expectancy and quality at the end of life are shifting with the aging population.

Breast cancer

Nearly 50% of breast cancers are diagnosed in women over the age of 65.[1] A systematic review has shown that there is a benefit to screening with mammography in women over the age of 65 annually or biannually, and that if no significant co-morbidities exist, there are mortality and down-staging benefits to screening women over age 75.[2] Potential harms outweigh benefits around age 85, or at younger ages, if co-morbidities limit life expectancy to less than 5 years. Studies are ongoing that are designed to compare the natural course of breast cancers in younger women versus those in older women. At this point there are no data sufficiently compelling to alter screening guidelines. This research will elucidate whether tumors first diagnosed in older women differ in aggressiveness or treatment responsiveness from those diagnosed in younger women.

Table 1: Recommendations for method and frequency of cancer screening

Cancer Site	Method of Screening	Frequency	Start	Stop
Cervical	Pap test	At least every three years	Three years after start of intercourse, no later than age 21.	65 to 70 years old if no abnormal Pap within past 10 years
Breast	Mammogram	Annually	Age 40 if not high risk	Age 85 or life expectancy less than 5 years
	Clinical Breast Exam	Every three years during 20's and 30's, annually after age 40	Age 20	
Prostate	Serum PSA	Annually	Age 50, or age 45 for high risk	Age 75 or life expectancy less than 10 years
Colorectal	Colonoscopy	Every 10 years	Age 50 or 10 years prior to diagnosis first degree relative	No official recommendations
	FOBT	Annually		
	Flexible sigmoidoscopy	Every 5 years		

Cervical cancer

Twenty-five percent of new cases of cervical cancer are diagnosed in women over 65 years old, with 10% over the age of 75.[3] Guidelines from the American Cancer Society recommend that women between 65 and 70 year old, who have had three or more consecutive normal Pap tests in the last ten years, may choose to stop screening.[4] Despite the significant reduction in cervical cancer mortality that Pap screening has conferred, it has also been shown that a majority of women over age 60 with a new diagnosis of cervical cancer were diagnosed as a result of symptoms rather than because of an abnormal

Pap smear.[3] This suggests that this demographic may be under-screened in general. Recent survey data show that primary practitioners place sexual history at a lower priority in the older female population, and that screening is offered less often to older women with co-morbid conditions.[5] The role that multiple sexual partners, contraception use, and HPV infection play in increasing the risk of cervical cancer is less frequently considered in the population of women over age 65. It may be that these factors will contribute to a revision of the current guidelines for cervical caner screening in the older female population.

Prostate cancer

Until recently, the guidelines for **prostate specific antigen (PSA)** and **digital rectal examination (DRE)** screening for prostate cancer were to start screening non-high-risk men at age 50, and continue annually until ten years of expected life remained. [6] A recent update to the **United States Preventative Services Task Force (USPSTF)** guideline has recommended that men over the age of 75 discontinue screening by serum PSA levels.[7] Evidence co-published with the recommendation suggests that false-positive PSA screening results cause psychological adverse effects for up to one year after the test, unnecessary testing and treatment with resultant morbidity.[8] The indolent nature of many prostate cancers and high morbidity associated with radical prostatectomy and radiotherapy make this a reasonable course for some men, though there has been some resistance to this recommendation in the primary care community. Future observation and study will help determine whether men over age 75 will benefit or be harmed as a result of this recommendation change.

Colon Cancer

Approximately two-thirds of colorectal cancer is diagnosed in persons over the age of 65, and 25% is diagnosed over the age of 80.[9] Current screening recommendations are for colonoscopy every ten years starting at age 50 (or ten years prior to the age of diagnosis in a first-degree family member), yearly **fecal occult blood testing (FOBT)**, flexible sigmoidoscopy, or double-contrast barium enema every 5 years.[10] There are no official guidelines indicating the upper age limit of colorectal cancer (CRC) screening. As in other areas, life expectancy is the most often utilized guide for screening termination. A recent study shows that primary providers are under-utilizing CRC screening in patients over 65, and the most common reason patients in this age group did not participate in screening for CRC is that their physicians did not recommend testing.[11] The study also demonstrated a deficit patient understanding of appropriate screening timing and methods for CRC screening, suggesting a potential benefit of patient education by primary providers.

Despite the further clarification that cancer screening guidelines merit, the case of MS is reasonably straightforward. There is a possibility that she has had an abnormal result in the past, and as there are no records to establish her past care she should be screened. That she is asking for advice at all suggests she is concerned, and would likely benefit irrespective of the test result. In the current era, referring to persons over age 65 as "elderly" is more arbitrary than ever before. Knowledge of the importance of a healthy lifestyle combined with the resources available to manage chronic diseases has significantly improved the quality of life for the oldest two-thirds of the population. Many of the studies that guide screening practices are skewed toward the younger of this age range, and the management of the oldest old is in many cases left to the individual clinician's opinion. As the silver tsunami approaches,[12] there will likely be a louder call for evidence that explicitly supports or discourages cancer screening in more-specifically defined older adult populations.

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Health By Numbers
Rhode Island Department of Health • David Gifford, MD, MPH, Director of Health
Edited by Samara Viner-Brown, MS

Self-Report of Sugar-Sweetened Beverage and Fast Food Consumption by Annual Household Income

Patricia Markham Risica, DrPH, RD, Stephen Kerr, Eliza Lawson, MPH, Randi Belhumeur, MS, RD, LDN, CDOE, and Angela Ankoma, MSW, MPH

The proportion of Rhode Island adults who are obese or overweight has increased drastically in the past 15 years.[1] Both consumption of **sugar-sweetened beverages (SSB)** and consumption of **fast food (FF)** are associated with obesity.[2-5] This report presents Rhode Island survey data on SSB and FF consumption, by income level.

Methods

In 2007, the **Behavioral Risk Factor Surveillance System (BRFSS)** used a multistage sampling design based on random-digit-dialing methods to select a representative sample of the non-institutionalized civilian population aged ≥18 years in Rhode Island. Details on the design, sampling procedures, and measures used in BRFSS have been described previously. [6]

The 2007 BRFSS questionnaire included standardized core questions as well as additional questions asked only in Rhode Island. The survey asks for income: "What is your annual household income from all sources?" Of the additional questions, some focused on obesity-related risk factors, including consumption of SSB and FF. These questions were asked in an open-ended fashion; e.g., "Yesterday, how many glasses, bottles or cans of soda (such as Coke or Sprite) or other sweetened drinks (such as fruit punch or Sunny Delight) did you drink? Do not include diet or sugar free drinks." Interviewers were allowed to add if necessary, "That would be a large glass or a 12 oz. can or bottle. The average juice pack is 6 oz or ½ a can," and were allowed to supply "This includes drinks such as Hawaiian punch, Hi-C, Snapple, Gatorade, other sports drinks, milk with added sugar, and sugar sweetened milk, e.g. coffee milk." Fast food was asked, "In the past week, how many times did you eat fast food or pizza at work, at home, at fast-food restaurants, carryout or drive thru, or somewhere else?" Interviewers were allowed to read if necessary, "Such as food you get at McDonald's, Burger King, Taco Bell, KFC, or Pizza Hut," and further if strongly needed, "foods from American-style fast food restaurants."

Statistical Analyses

The sample of 12 months was combined to one sample, and weighted to the respondent's probability of selection and to the age- and sex-specific population or age-, sex-, and race-specific population data using the 2007 census projections reported by the Census Bureau for Rhode Island. Detailed weighting and analytic methodologies have been documented previously.[7]

Income was coded as <$25K, $25K-34,999, $35K-49,999, $50K-74,999 and ≥$75,000. Reported SSB consumption was coded as one or more servings per day, and FF as one or more times per week. SSB and FF consumption were assessed with income status by chi square using SAS®[1] and SUDAAN®[2] to adjust for weights. Responses coded as "do not know" or "refused" were excluded from the analyses.

Results

Higher reported SSB consumption was associated with lower income status. Thirty-five percent of respondents in the $25,000 or less group reported consuming SSB in the previous day. FF also differed by income, but was highest in the middle income groups ($35,000-75,000) where over 60% of respondents reported FF consumption more than once a week. Lower FF consumption was reported in the highest and lowest income groups.

Discussion

BRFSS data for SSB and FF consumption reveal differences in the consumption of both based on income levels. A larger proportion of adults who are in the lowest income bracket are consuming one or more SSB per day, while a larger proportion of adults who are in the middle income bracket are consuming FF one or more times per week. Higher SSB consumption among low-income populations is consistent with prior results from two smaller studies.[10,11] More frequent FF consumption among high-income populations has also been shown in the literature, but the highest consumption among those with middle income has not been previously reported to our knowledge.[12-14]

The consumption of SSB can result in excess caloric intake. Studies suggest that the additional calories from SSB are not compensated for by reducing calories from other foods.[15, 16] Because more nutrient-dense beverages such as milk tend to be more expensive than SSB, lower income populations may choose SSB over healthier options for financial reasons. While efforts aimed at decreasing SSB consumption should include education, additional efforts can include strategies to make healthier options more and SSB less financially attractive to the lowest income populations. Another strategy that has been implemented to decrease SSB consumption is to limit access. In 2006, the Rhode Island General Assembly banned all beverages except water, milk and 100% juice in school vending and *a la carte* venues.

Eating more FF is linked to eating more calories, more saturated fat, fewer fruits and vegetables, and less milk.[17] Expenditures on food eaten away from home have increased drastically since 1977:[18] Americans now spend almost half of their food expenditures on these foods.[19] Increased demands on fami-

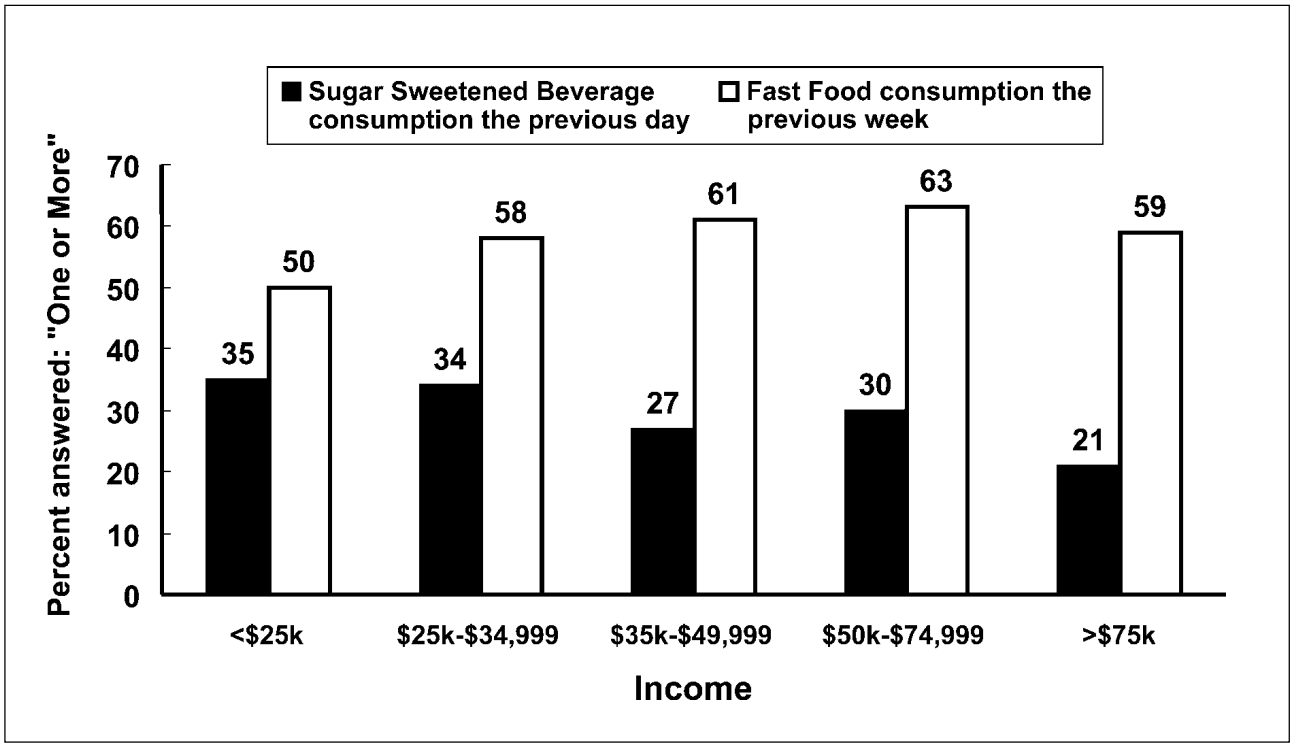

Figure 1. Self-Report of Sugar Sweetened Beverage and Fast Food Consumption, Ages 18 and Older, by Annual Household Income, Rhode Island BRFSS, 2007

lies' time are making fast food a tempting option. Strategies to decrease caloric consumption from fast food could focus on helping consumers make better choices when eating away from home. Some states now require certain restaurants to provide nutrient information at the point of purchase.

Further attention to help Rhode Islanders at highest risk of SSB and FF consumption to decrease these behaviors is appropriate to help stem the tide of overweight and obesity in Rhode Island.

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Prostate Cancer Screening Practice and Knowledge In Rhode Island

Arvin S. Glicksman, MD, Andrea Meyer, and Kathleen Cullinen, RD, LDN, PhD

Rhode Island has had the highest incidence of cancer in the country, but over the last decade the death rate from cancer has fallen to "average" for the United States.[1] For the most part, this has been accomplished by the combined efforts of the medical and public health community to bring cancer awareness and health education, particularly cancer screening, to the state population in general and to the disparate populations, specifically.

Prostate cancer screening has been controversial. The US Preventive Services Task Force recommends that men be advised of both the potential benefit and potential harm. To understand how prostate screening is being utilized in Rhode Island, the **Rhode Island Cancer Council (RICAN)** conducted two surveys to examine screening referrals and practices based on policies of both urologists and primary care physicians and public knowledge of perceived risk factors.

In Rhode Island prostate cancer incidence is 9% higher than the national average in the period 1996 – 2003.[2] The majority of Rhode Island males 40 years and older have been screened for prostate cancer. To understand screening practices in Rhode Island, we surveyed 150 primary care physicians (response n=79, 52%). (Table 1) Eighty-five percent performed **annual Prostate Specific Antigen (PSAs)** and **Digital Rectal Examinations (DREs);** 86% recognized that there are high risk groups for whom prostate screening should be initiated earlier than at the recommended age of 50. Sixty-three percent of respondents recognized family history as a high risk factor. Only 14% identified non-Hispanic black African-Americans as being a high risk population although this population has a 50% higher incidence than non-Hispanic white men.[3]

A population-based study of men over 40 was undertaken with the respondents mirroring the Rhode Island population. (Table 2a) We were concerned that African-American men may not be receiving prostate screening since physicians reported in our survey that they did not

Table 1.

PROSTATE CANCER SCREENING SURVEY OF RHODE ISLAND PRIMARY CARE PHYSICIANS (n=79)			
QUESTION	Percentage of Primary Care Physicians		
"As a Primary Care Physician in Rhode Island, what is your recommendation to males over 50?"	Yes	No	N/a
Annual Prostate-Specific Antigen (PSA) test and Digital Rectal Exam (DRE)	85	13	2
Advise males of the availability of PSA test and DRE	71	4	25
Perform PSA test and DRE upon patient request only	4	62	34
"Are there 'high risk' groups who you suggest screening at age 40?"	86	5	9
"If so, what factors determine which males are at 'high risk?'"	Percentage of Total Responses (175)		
Family History	63		
Evidence of Symptoms	20		
Non-Hispanic Black/African American Race	14		
Testosterone Replacement	1		
Abnormal DRE	2		

Table 2a.

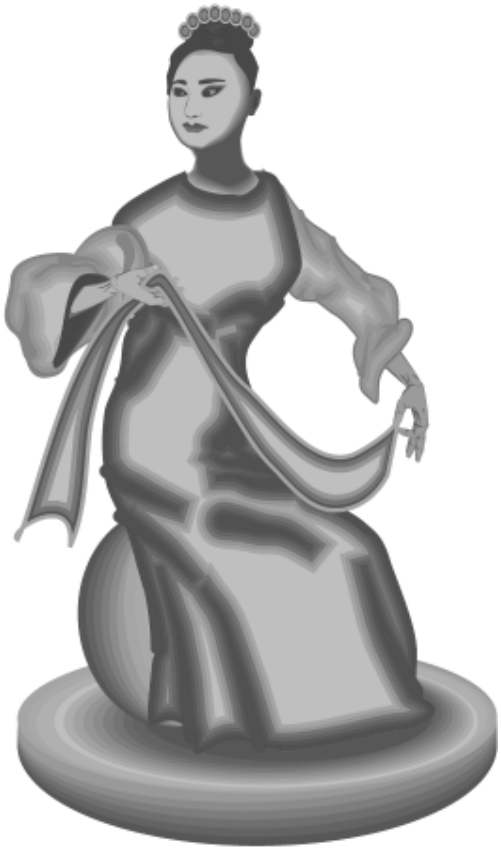
PROSTATE CANCER SCREENING		
RACE/ETHNICITY OF MALE RESPONDENTS (n= 194)		Rhode Island Census 2000
Race/Ethnicity	*Percentage*	
White	85	82
Non-Hispanic Black/African-American	6	6
Hispanic latino	2	9
Asian/Pacific Islander	1	1
Native American	5	1
Other/Not Stated	2	1

Table 2b.

PROSTATE CANCER SCREENING	
PERCENTAGE OF RESPONDENTS REPORTING SELECT RISK FACTORS FOR INCREASED PROSTATE CANCER	
Risk Factor	*Percentage*
Family History	48
Evidence of Symptoms	16
Non-Hispanic Black/African-American	6

perceive African-American men as being at high risk. Of 194 men who responded to the survey, 48% recognized family history as putting them at a higher risk. If they had symptoms, 16% thought that represented a prostate risk, but only 6% understood that if they were non-Hispanic black African-Americans, they were at high risk. (Table 2b)

There is a significant information gap among primary care physicians as well as in the general population as to the risk of the African-American community in Rhode Island. RICAN has been delivering prostate cancer education, including the successful award-winning "PawSox and Prostates" program* at which prostate education is delivered to men at a PawSox game; however, more programs directed at primary care physicians, urologists, and particularly the African-American community are needed in Rhode Island.



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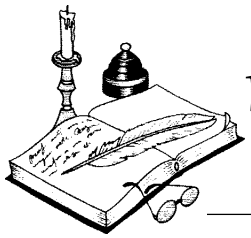

Physician's Lexicon

Onward and Upward With Prefixes

The often-used Greek prefix, *epi-* conveys a bushel of meanings including the sense of on, beside, above or anterior to; in general, though, it tells the reader that the word carries the sense of being above or directionally superior to. In anatomy, the prefix appears in words such as epicardium, epicene, epicenter, epiglottis, epigastrium, epididymis, epicranium, epithelium, epiphysis, epicanthus, epinephros [in Latin, suprarenal] and epidermis, all self-evident in meaning. Some words need a bit of etymological imagination to understand such as epistaxis [literally to let fall upon in drops], epilepsy [to take hold of, to seize] or epidemic [prevalent in, or upon, the people.] And when the root begins with a vowel, the "i" of *epi-* is then dropped [as in ependyma, ephebic, ephedrine and epaxial.]

Problems, semantic ambiguities, do arise with many of the non-medical terms beginning with *epi-*. For example, ephemeral [literally upon a single day] is employed to describe insects, and other non-biological phenomena that are short-lived, such as the mayfly or some Broadway shows. The entomological genus for insects with very brief adult lives is *Ephemera*.

Then there are theological words beginning with *epi-*. Episcopal pertains to a bishop [Greek, *episkopus,* meaning overseer]; epiphany [a divine apparition, and more broadly a divinely inspired thought]; and epistle [originally meaning to set in order; then later pertaining to orders conveyed by a letter or missive.] An epilogue is a sermon or peroration said at the end of the day.

An epicure is a person given up to sensual enjoyment. The word is patterned after Epicurus [an Athenian philosopher, 342 – 270 BCE, who defined a school of philosophy that proclaimed joy, sensual pleasure and lack of pain as the goals of humanity.] His name may be freely translated as "about youth." An episode was originally meant to designate something that arrived additionally, something extra and *odos*, meaning a path or way.

The meanings of four nouns beginning with *epi-* [epigram, epitaph, epithet, eponym] tend to be confused with each other. An epigram means a brief, witty statement, literally meant to write upon or to supplement something that had already been written. ["What is an Epigram? A dwarfish whole. Its body brevity, and wit its soul" Coleridge.] An epitaph is a funeral oration or is something written or enscribed upon a tombstone. An epithet is something appended to a person's name as a sobriquet adding some attribute to the name [e.g., Alexander the Great, Joe DiMaggio, the Bronx Bomber.]

– Stanley M. Aronson, MD

Vital Statistics

Rhode Island Department of Health
David Gifford, MD, MPH
Director of Health

Edited by Colleen Fontana, State Registrar

Rhode Island Monthly Vital Statistics Report Provisional Occurrence Data from the Division of Vital Records

Underlying Cause of Death	Reporting Period			
	February 2008	12 Months Ending with February 2008		
	Number (a)	Number (a)	Rates (b)	YPLL (c)
Diseases of the Heart	116	2,294	214.4	2,857.5
Malignant Neoplasms	100	1,991	186.1	5,310.0
Cerebrovascular Diseases	15	347	32.4	537.5
Injuries (Accidents/Suicide/Homicde)	21	451	42.2	7,501.5
COPD	30	376	35.1	247.5

Vital Events	Reporting Period		
	August 2008	12 Months Ending with August 2008	
	Number	Number	Rates
Live Births	1,095	12,688	11.9*
Deaths	843	9,993	9.4*
Infant Deaths	(11)	(81)	6.4#
Neonatal Deaths	(9)	(62)	4.9#
Marriages	987	6,285	5.9*
Divorces	234	2,821	2.6*
Induced Terminations	not available	not available	not available
Spontaneous Fetal Deaths	40	814	64.2#
Under 20 weeks gestation	(33)	(742)	58.5#
20+ weeks gestation	(7)	(72)	5.7#

(a) Cause of death statistics were derived from the underlying cause of death reported by physicians on death certificates.

(b) Rates per 100,000 estimated population of 1,067,610

(c) Years of Potential Life Lost (YPLL)

Note: *Totals represent vital events which occurred in Rhode Island for the reporting periods listed above. Monthly provisional totals should be analyzed with caution because the numbers may be small and subject to seasonal variation.*

* Rates per 1,000 estimated population

\# Rates per 1,000 live births

THE RHODE ISLAND MEDICAL JOURNAL

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VOLUME 1
NUMBER 1

PROVIDENCE, R.I., JANUARY, 1917

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February 1919, Ninety Years Ago

The Rhode Island Medical Society suspended publication of the Journal until 1920 because key staff members were serving in World War I.

February 1959, Fifty Years Ago

Paul C. Colonna, MD, Professor of Orthopedic Surgery, University of Pennsylvania School of Medicine, delivered the Second Dr. Murray S. Danforth Oration, "The Un-United Hip Fracture." The Journal reprinted his talk.

Alton McPaull, MD, in "Toxic Reactions to Iodine," summarized details on 3 patients he had treated, and 4 who had been treated at the Veterans Administration Hospital in Providence. The sources of the iodine were either inorganic (e.g., potassium iodide), organic (e.g., Organidin and Amend's solution), or a mixture with other drugs (e.g., Quadrindal). The treatment was to discontinue the iodine. The author reassured readers: "Iodine is rarely fatal." Cortisone may alleviate symptoms.

Joseph G. Williams, MD, President, the Providence Medical Society, gave the Presidential Address to that group: "The Telephone That Never Sleeps." He described the Medical Bureau, established in 1949 in the basement of the Medical Society headquarters at Francis Street. Up to 5 switchboard operators could work at one time; in sum, the Bureau employed 17 operators, serving 383 physicians. The Bureau averaged 2750 calls a day, including referrals, questions, incoming messages. Dr. Williams reported that it took one year to train an operator; applicants came with experience at the telephone company.

Warren W. Francis, MD, and Jorge Benavides, MD, in "Traumatic Rupture of the Spleen," reported on the 30 cases admitted to Rhode Island Hospital from January 1946 to August 1958 with that diagnosis. Splenectomy was the "treatment of choice." Twenty-five patients had a splenectomy; 3 had repair of the injury. Two patients (not among those to undergo surgery) died.

February 1984, Twenty-Five Years Ago

J. Joseph Garrahy, Governor of the State of Rhode Island, contributed an editorial: "The Importance of Public Involvement in Organ Procurement," to introduce this issue. He noted that 20,000 potential donors died each year; 90% did not donate organs.

On the Presidential Page, Charles P. Shoemaker, Jr, MD, contributed "Public Awareness Campaign and Long-Range Planning," focusing on scarce donated organs.

Judith Shaw Lucien, RN, James W. Bradley, and Sang I. Cho, MD, in "Organ Procurement: The Role of the New England Organ Bank," hoped that the NEOB, established in 1968 as a collaboration among the 13 renal transplant centers in the region, would "serve as a model for a national procurement system."

Charles E. Millard, MD, in "The NIH Consensus Development Conference on Liver Transplantation," reported: "The Panel finds liver transplants to be beneficial under appropriate circumstances for some patients." Specifically, the American Liver Foundation had estimated that "of 1 million hospital admissions and 50,000 deaths in 1983, attributable to liver disease…only 5,000 of these patient would be suitable candidates for the procedure."

Paul S. Koch, MD, in "Corneal Transplantation: Current Concepts and Priorities," reported: "Success rates for the operation are nearly as high as for cataract surgery."

Robert A. ReNoble, MBA, reported on "Development of the Protocol for Organ Procurements at Rhode Island Hospital."

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