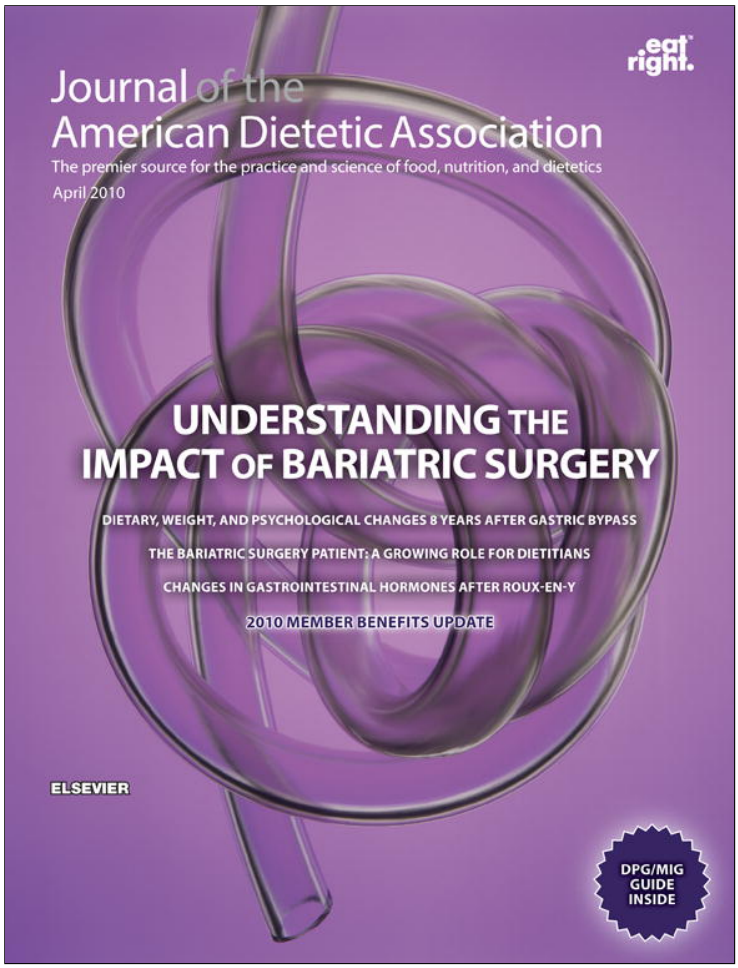

American Dietetic Association

RESEARCH

Research Editorial

Bariatric Surgery: A Key Role for Registered Dietitians

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Obesity is a complex disorder that impacts all organ systems. Individuals with obesity are at increased risk for a variety of comorbid conditions, including diabetes, hypertension, dyslipidemia, heart disease, sleep apnea, some types of cancer, nonalcoholic fatty liver disease, and osteoarthritis, among others. Those at highest risk are individuals with class III obesity (body mass index ≥40), a group that now includes almost 5% of all adults and more than 10% of all African-American adults in the United States (1).

Nonsurgical approaches to the treatment of obesity, including lifestyle modification and pharmacotherapy, typically result in average weight losses of 5% to 10% of initial body weight. Importantly, losses of this magnitude can substantially improve existing comorbidities and prevent new weight-related conditions, including diabetes (2,3). However, studies suggest that most individuals with obesity hope to lose considerably more weight, often as much as 20% to 40% of initial body weight, and they may view lesser degrees of weight loss as a disappointment or even a failure (4,5). In addition, the physiologic adaptations to weight loss, including reductions in energy expenditure and changes in hunger- and satiety-promoting hormones, make it more difficult for individuals to maintain a reduced body weight over time (6). As a result, successful weight management is an elusive goal for many patients with obesity who utilize nonsurgical therapies. The four articles presented in this issue of the *Journal* highlight the growing importance of surgical therapies in the care of patients with obesity and the role of registered dietitians (RDs) (7-10).

Current bariatric surgical techniques include the two most common procedures, Roux-en-Y gastric bypass (RYGB) and laparoscopic adjustable gastric banding (LAGB), and several less common procedures, including laparoscopic sleeve gastrectomy (LSG) and biliopancreatic diversion with duodenal switch (BPD-DS). Potential mechanisms of action are shown in the Figure and include restriction of gastric capacity, modulation of gastrointestinal hormones that influence hunger and satiety, and induction of malabsorption (11-13). Beckman and colleagues provide a comprehensive literature review of one of these mechanisms, changes in gastrointestinal (GI) hormones that occur after the RYGB procedure (9). As stated in their review, "An understanding of how GI hormones change after RYGB may help dietitians to optimize nutrition care to this patient population" (9). Knowledge of gut hormones is also important to RDs because pharmaceutical companies have focused on the manipulation of these hormones as peripheral targets for appetite regulation (14).

At this time, bariatric surgery is the most effective intervention for severe obesity, producing substantial weight loss (typically on the order of 30% to 70% of excess body weight) that is largely maintained over time (15). The benefits of bariatric surgery also include high rates of remission of many obesity-associated comorbidities, including diabetes, hypertension, and dyslipidemia, as well as an improvement in quality of life and a reduction in mortality rates (15,16). As a result of this success, the number of bariatric procedures done annually has increased dramatically in recent years, as noted in the accompanying review by Kulick and colleagues (7). In light of the increasing prevalence of severe obesity, this trend is likely to continue.

RDs are accustomed to working in a team environment to provide care for patients with various disorders, including obesity. In fact, team practice for the treatment of obesity has become an established model of care. Hospital nutrition teams were initially established in the 1970s, shortly after the introduction of new technology for the invasive administration of specialized parenteral and enteral nutritional products. Typically comprised of an attending physician, RD, registered nurse, and pharmacist, these teams were established to provide safe delivery of optimal nutritional support while minimizing complications. The team-oriented, multidisciplinary approach to patient care was subsequently applied to the care of patients with diabetes, as exemplified in two landmark diabetes studies: the Diabetes Control and Complications Trial (17) and the Diabetes Prevention Program (2). Interdisciplinary teams are also an important component of the chronic care model (18). It is with this perspective that the team approach to obesity care has evolved (19). In 1991, the National Institutes of Health consensus report on Gastrointestinal Surgery for Severe Obesity recommended multidisciplinary teams with medical, surgical, psychiatric, and nutritional expertise (20).

In the articles by Kulick and colleagues (7) and Snyder-

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Manuscript accepted: December 15, 2009.

0002-8223/10/11004-0002$36.00/0

doi: 10.1016/j.jada.2009.12.030

	LAGB[a]	LSG[b]	RYGB[c]	BPD-DS[d]
Gastric restriction	+	+	+	+
Modulation of gastrointestinal hormones	−	+	+	+
Macronutrient malabsorption[e]	−	−	+/−	+

[a]LAGB=laparoscopic adjustable gastric banding.
[b]LSG=laparoscopic sleeve gastrectomy.
[c]RYGB=Roux-en-Y gastric bypass.
[d]BPD-DS=biliopancreatic diversion with duodenal switch.
[e]Macronutrient malabsorption does not occur with standard RYGB but may occur with long-limb procedures.

Figure. Potential mechanisms of action of four bariatric procedures used in the United States.

Marlow and colleagues (8), the authors review the essential role for RDs in the preoperative and postoperative care of bariatric surgery patients. The practice skills of assessment and counseling along with knowledge of nutrient malabsorption and dietary plans specific to the bariatric surgery procedures are needed by RDs working in this field. These articles provide an up-to-date and timely overview of dietary management for the RYGB and LSG procedures, respectively. Bariatric surgery teams typically include an obesity medicine physician, bariatric surgeon, clinical psychologist, RD, and exercise specialist, and are intended to provide best practices in patient care and improved clinical outcomes. Optimization of care is the basis for creation of the Center of Excellence concept developed by the American Society for Metabolic and Bariatric Surgery (21), the American College of Surgeons (22), and some private insurers. Advanced training for the RD choosing to work in this field is also provided by the Commission of Dietetic Registration, the credentialing agency for the American Dietetic Association, through the award of a certificate of training in Adult or Pediatric Weight Management. Similarly, a certified Obesity Medicine Physician initiative is currently under way, led by a 13-member association steering committee that includes the Obesity Society, American Heart Association, American Diabetes Association, and the American Academy of Pediatrics, among others.

Although guidelines for the nutrition and dietary management of bariatric surgery patients have recently been published (15,23), the majority of the evidence-based guidelines are supported only by expert opinion. As noted by Kulick and colleagues (7) and Snyder-Marlow and colleagues (8), the recommendations provide practical guidance based on limited literature. Herein lies the need for clinical research to answer important nutrition and dietary questions in this population. For example, what is the optimal micronutrient intake for patients who undergo restrictive/malabsorptive procedures? What is a sufficient serum level for 25-hydroxy-vitamin D? How do we best preserve lean body mass?

The article by Kruseman and colleagues (10) asks equally important questions. What are the changes in diet, anthropometry, eating behavior, psychological state, and quality of life among 80 women 8 years after undergoing an RYGB procedure? Are there differences among the 47 patients who were successful (lost ≥50% excess body weight) compared with those patients who lost less weight? By assessing the subjects at baseline and at last visit, the authors made some important observations: eating behavior and psychological state did not improve significantly during follow-up. Successful and unsuccessful patients experienced similar rates of problematic eating behavior, depression, and anxiety. Patients who reported higher scores on ineffectiveness and social insecurity scales on the Eating Disorder Inventory II instrument at baseline were more often successful than were the others. The existing literature on psychological outcomes among patients who have bariatric surgery generally describe significant improvements in psychosocial functioning, although negative psychological effects have been reported (15). As stated by Kruseman and colleagues (10): "The findings of this study reinforce the importance of interdisciplinary care for patients who undergo gastric bypass."

RDs and medical nutrition therapy are essential components of any treatment approach used in obesity care. The four articles in this issue of the *Journal* that address bariatric surgery provide important background information for dietitians who work in this field.

STATEMENT OF POTENTIAL CONFLICT OF INTEREST: No potential conflict of interest was reported by the authors.

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