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Effect of a Re-Intervention Lifestyle Approach on Prevention of Weight Regain and Long-Term Weight Loss in the Severely ObeseAmy D. Otto, Bret H. Goodpaster, John M. Jakicic, Jolene Brown, Linda Semler
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Weight loss interventions for severely obese (Class II and III) often focus on pharmacotherapy or bariatric surgery options, and rarely focus solely on lifestyle modification (diet and exercise alone). This study examined the effects of a lifestyle intervention on change in body weight resulting from a 12-month intervention, after a non-intervention follow-up, and after a 3-month re-intervention of the lifestyle intervention in 33 severely obese (Class II: 35.0-39.9 kg/m² and Class III: >40 kg/m²) adults (BMI: 45±6.9 kg/m², Age: 48.8±5.9 years). During the 12-month intervention and the 3-month re-intervention the participants received a reduced calorie diet (1200-2000 kcal/wk) and exercise was progressively increased to 300 min/wk. The length of the non-intervention follow-up period was 1.2±0.5 years. The 12-month intervention resulted in significant weight loss (14.6±8.6 kg, 12.2±7.4%), with 8.6±10.8 kg (7.6±9.3%) sustained weight loss following the non-intervention follow-up period (p<0.05). Thus, average weight regain was 5.6±7.2 kg (38.7% of initial weight loss) during the non-intervention follow-up period (p<0.05). The 3-month re-intervention resulted in prevention of further weight gain and induced a non-significant weight loss of 1.0±3.3 kg, resulting in total weight loss of 9.9±11.1 kg (8.3±9.6%) (p<0.05). These results demonstrate that a lifestyle intervention focusing on diet and exercise can be effective at reducing weight in severely obese; however, termination of the intervention results in significant weight regain. This suggests the need for continued long-term intervention, and periodic re-intervention may facilitate prevention of weight regain, resulting in the ability to sustain significant long-term weight loss.

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Risk Factor Reduction and Amount of Weight Loss Within a Short-Term Comprehensive Program Using a Partial Meal-Replacement DietJoshua D. Brown, Vanessa A. Milsom, Gail E. Cronan, Patrick M. O'Neil
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Background: Studies with average weight losses of 5-10% commonly show average improvement in obesity-associated risk factors. Fewer data address the question of whether weight losses limited to 5-10% produce improvements or whether greater losses cause greater improvements, especially within relatively short-term programs. Methods: We examined archival data from male (n=35) and female (n=121) overweight or obese adults who completed a 15-week comprehensive weight loss program including a partial meal replacement low-calorie diet. Fasting lipids and blood glucose were assessed pre- and post-treatment. Changes in these risk factors were assessed for the whole sample and according to amount of weight lost (<5%, 5-10%, >10%). Results: Mean weight loss was 10.02% (SD=4.57%) of baseline weight. For the entire sample, significant reductions (ps<.05) were seen on total, LDL and HDL cholesterol, triglycerides and glucose. Patients who lost >10% experienced greater improvements in total and LDL cholesterol than did patients who lost 0-5% and 5-10%, with no differences between the latter two groups or on the other risk factors. Patients losing 5-10% showed improvements in total and LDL cholesterol and triglycerides but not glucose or HDL. Among subjects with baseline values of the risk factor beyond recommended cut points, significant (p<.05) reductions were seen on triglycerides (N=41), total cholesterol (N=65), LDL cholesterol (N=113), and glucose (N=56), but not on HDL (N=82). Conclusions: Weight loss of 5-10% appears to produce improvement in some, but not all risk factors. Greater weight loss is associated with greater improvements.

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Nutritional Correlates of Energy Density Before and During a 12-Week Weight Loss TrialPatrick M. O'Neil, Tonya F. Turner, Laura M. Nance, Gail E. Cronan, Robert J. Malcolm, Susan M. Pechon, *Charleston, SC*; Stephanie L. Rost, Karen Miller-Kovach *New York, NY*

Background: Cross-sectional population studies show that more energy-dense dietary intakes feature greater caloric and fat consumption. Less is known about nutritional correlates of energy density among participants in weight loss programs.

Methods: 108 completers (of 132 enrolled adults, BMI 27-35) of a 12-week weight-loss trial kept a 3-day food diary at screening, Week 6 and Week 12. They were given a structured food plan under one of two randomly assigned systems, and asked to attend weekly group meetings. Energy density [mean daily caloric intake (foods + non-water beverages)]/[mean daily weight of all intake excluding water] at each assessment was calculated. Results: Treatment groups did not differ on weight loss or macronutrient intake (%kcal) and were combined for analyses. Energy density declined from screening to Weeks 6 and 12. At all times, higher energy density was significantly (ps<.05) associated with greater caloric (rs=.20 to .27), fat (rs=.32 to .47) and saturated fat (rs=.29 to .36) intake, and lower fiber consumption (gm/1,000 kcal; rs=-.27 to -.34) and weight of intake (rs=-.63 to -.72). Energy density was negatively related to protein intake at screening (r=-.30) and to carbohydrate intake at Weeks 6 and 12 (rs=-.26 to -.35) (ps<.01). At no time was energy density significantly related to intake of calcium, sodium, zinc, iron, Vitamins A,C,D,E, or alpha-tocopherol. Conclusions: Before and during weight loss, energy density based on food and non-water beverages was consistently related to intake of calories, fat, saturated fat and fiber. Variations in energy density did not affect intake of the vitamins and minerals examined.

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Changes in Dietary Energy Density With Participation in a 12-Week Weight Loss Trial Using a Commercial FormatPatrick M. O'Neil, Gail E. Cronan, Tonya F. Turner, Laura M. Nance, Robert J. Malcolm, Susan M. Pechon *Charleston, SC*; Stephanie L. Rost, Karen Miller-Kovach *New York, NY*

Background: Energy density of dietary intake (kcal/gm) is related to total energy intake and BMI in the population. Less is known about how it changes in short-term weight loss programs or relates to weight loss. Methods: A 12-week weight-loss trial compared two randomly assigned structured food plans. Subjects (132 adults, BMI 27-35) were given limits in their randomly assigned system and asked to attend weekly group meetings. Subjects kept a 3-day food diary at screening, Week 6 and Week 12. Complete intake records were obtained on 108 subjects. Energy density at each point was [mean daily caloric intake (foods + non-water beverages)]/[mean daily weight of all intake excluding water]. Results: Groups did not differ on weight loss or nutrient intake and were combined for analyses. Average weight loss was 3.01% (SD=2.23%) at Week 6 and 4.30% (SD=3.74%) at Week 12. Both daily caloric intake and weight of intake were significantly lower at Weeks 6 and 12 than at Screening (ps<.01), with the drop in caloric intake proportionately greater than that in weight of intake. Thus, energy density decreased significantly from Screening (M=1.09, SD=.28) to Week 6 (M=.96, SD=.31) and Week 12 (M=.97, SD=.29), ps<.005. Lower energy density was related to greater weight loss at Weeks 6 and 12 (rs=-.203 and -.237, respectively, ps<.05). Conclusions: Energy density based on food and non-water beverages appears to be a meaningful nutritional variable that responds to a weight loss intervention and relates to weight loss.

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Comparison of Compliance to a Low-Carbohydrate High-Protein, or Low-Fat High Fiber DietMitali Shah, Megan R. Ruth, Ava M. Port, Ashley C. Bourland, Caroline M. Apovian *Boston, MA*

Background: A major limitation of dietary interventions is non-compliance to diet, which affects outcome measures. Thus, we sought to determine compliance to two isocaloric diets and resulting differences in macronutrient composition on select outcome measures. Methods: Obese subjects (88% female, 21-61 yr, BMI 32.3-44.6 kg/m²) were randomized to a low-carbohydrate high-protein (LCHP), or low-fat high fiber (LFHF) diet for 12 wk (n=8/group). Weight, waist circumference and % body fat (by DXA) were measured at week 0 and 12. Visit attendance (≥9 visits), 3-d food record completion (≥4 records) and macronutrient intake (±10% recommended) defined compliance. Composition (% kcal) of LFHF diet was 60% carbohydrate (CHO), 25% fat, and 15% protein. LCHP diet consisted of ≤40 g CHO/d and up to 60% fat and remainder from protein. Differences between groups were determined by Student's T-test (P<0.05). Results: All subjects complied with visit attendance and 88% in both groups were compliant with food records. Neither group met macronutrient requirements.