

Effects of Lifestyle Activity vs Structured Aerobic Exercise in Obese Women

A Randomized Trial

Ross E. Andersen, PhD

Thomas A. Wadden, PhD

Susan J. Bartlett, PhD

Babette Zemel, PhD

Tony J. Verde, PhD

Shawn C. Franckowiak

OBESITY IS A SERIOUS AND common health problem. The most recent National Health and Nutrition Examination Survey (NHANES III) reported that 33.4% of Americans are overweight,¹ representing an increase from the 25% prevalence observed in the 1976-1980 survey.

Although it is commonly believed that easy access to high-fat foods and overeating are the simple causes of obesity, mean energy intake and fat consumption in industrialized countries have declined substantially as obesity rates have escalated.²⁻⁴ During this time, levels of physical activity have steadily declined and a report by the surgeon general⁵ indicates that only 22% of US adults are currently active enough to derive the health benefits conferred by physical activity. These findings have prompted public health advisors to recommend that all Americans strive to accumulate 30 minutes or more of moderate-intensity physical activity on most, or preferably all, days of the week.⁶

Blair and colleagues⁷ have described a lifestyle approach to physical activity;

See also pp 327 and 375 and Patient Page.

Context Physical inactivity contributes to weight gain, but only 22% of Americans are regularly active.

Objective To examine short- and long-term changes in weight, body composition, and cardiovascular risk profiles produced by diet combined with either structured aerobic exercise or moderate-intensity lifestyle activity.

Design Sixteen-week randomized controlled trial with 1-year follow-up, conducted from August 1995 to December 1996.

Participants and Setting Forty obese women (mean body mass index [weight in kilograms divided by the square of height in meters], 32.9 kg/m²; mean weight, 89.2 kg) with a mean age of 42.9 years (range, 21-60 years) seen in a university-based weight management program.

Interventions Structured aerobic exercise or moderate lifestyle activity; low-fat diet of about 1200 kcal/d.

Main Outcome Measures Changes in body weight, body composition, cardiovascular risk profiles, and physical fitness at 16 weeks and at 1 year.

Results Mean (SD) weight losses during the 16-week treatment program were 8.3 (3.8) kg for the aerobic group and 7.9 (4.2) kg for the lifestyle group (within groups, $P < .001$; between groups, $P = .08$). The aerobic group lost significantly less fat-free mass (0.5 [1.3] kg) than the lifestyle group (1.4 [1.3] kg; $P = .03$). During the 1-year follow-up, the aerobic group regained 1.6 [5.5] kg, while the lifestyle group regained 0.08 (4.6) kg. At week 16, serum triglyceride levels and total cholesterol levels were reduced significantly ($P < .001$) from baseline (16.3% and 10.1% reductions, respectively) but did not differ significantly between groups and were not different from baseline or between groups at week 68.

Conclusions A program of diet plus lifestyle activity may offer similar health benefits and be a suitable alternative to diet plus structured aerobic activity for obese women.

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in which sedentary adults incorporate short bouts of moderate-intensity activity into their daily routines, such as increasing the amount of walking in the daily routine, performing more yard work, and using the stairs when possible.

The purpose of this investigation was to examine short- and long-term changes in weight, body composition, and cardiovascular risk profiles produced by diet

Author Affiliations: Division of Geriatric Medicine and Gerontology (Dr Andersen and Mr Franckowiak) and Department of Medicine (Dr Bartlett), Johns Hopkins University School of Medicine, Baltimore, Md; Department of Psychiatry, University of Pennsylvania School of Medicine, Philadelphia (Dr Wadden); Children's Hospital of Philadelphia (Dr Zemel); and Department of Sports Science, Cabrini College, Radnor, Pa (Dr Verde).

Corresponding Author and Reprints: Ross E. Andersen, PhD, Johns Hopkins University School of Medicine, Division of Geriatric Medicine and Gerontology, 5501 Hopkins Bayview Cir, JHAAC 5B:81, Baltimore, MD 21224 (e-mail: andersen@jhmi.edu).

combined with either programmed aerobic exercise or lifestyle activity in obese women.

METHODS

Participants

Participants were 40 women with a mean (SD) age of 42.9 (8.3) years, weight of 89.2 (11.6) kg, height of 165.0 (7.1) cm, and body mass index (BMI [weight in kilograms divided by the square of height in meters]) of 32.9 (4.3) kg/m². All women reported not participating in a structured exercise program for the 6 months prior to the start of this intervention. Twenty-eight women were non-Hispanic white, 10 were non-Hispanic black, and 2 were Mexican-American. All were a minimum of 15 kg over ideal weight as defined by the Metropolitan Life Insurance tables.⁸ Before treatment, all subjects completed an initial interview at which time the requirements of the study were explained and the participants' weight and dieting histories, eating and exercise habits, and psychological status were assessed.⁹ Persons with bulimia nervosa, binge eating disorder, significant depression, or other psychiatric disturbances were excluded. Participants underwent a medical evaluation (performed by their personal physicians) designed to identify contraindications to diet, exercise, or both, including a recent myocardial infarction; a history of cerebrovascular, kidney, or liver disease; cancer; type 1 diabetes mellitus; pregnancy; or the use of medications known to affect weight or energy expenditure. All subjects completed a maximal treadmill stress test to rule out cardiac abnormalities that might be exacerbated by exercise training. This study was approved by the Institutional Review Board of the University of Pennsylvania, Philadelphia, and all participants gave their written informed consent to participate.

Study Procedures

Participants were randomly assigned to 1 of the 2 conditions described above. Treatment consisted of attending 16 weekly, 60-minute treatment sessions in groups of 10 members. The Lifestyle Exercise At-

titudes Relationships Nutrition (LEARN) Program for Weight Control was used.¹⁰ All participants agreed not to seek additional treatment during a 1-year follow-up evaluation. All participants were provided the same dietary intervention during the 16-week program. They were asked to consume a self-selected, low-fat, low-calorie diet of approximately 1200 kcal/d, which is consistent with American Heart Association guidelines for healthy weight reduction.¹¹

All participants received a similar cognitive behavioral weight loss program. Group sessions were led by master's- or doctoral-level psychologists. The 16 sessions were conducted following a modified version of the LEARN Program for Weight Control, and participants were provided with a copy of the manual.¹⁰ They were instructed in traditional behavioral methods of weight control that included keeping daily food and physical activity records and practicing other behaviors that have been described previously.⁴ Participants in the diet-plus-lifestyle-activity group also discussed strategies for accumulating activity and expending energy throughout the day. Those in the diet plus structured exercise group discussed the details of a traditional aerobic exercise program.¹² Emphasis in both groups was placed on adopting and maintaining physical activity as part of one's overall lifestyle.

Physical Activity

Diet Plus Structured Aerobic Exercise. Each week, participants attended 3 step aerobics classes held in a dance studio. Classes were choreographed to meet the fitness needs of overweight women and were led by a certified aerobics instructor. Classes were preceded by a 5- to 10-minute warm-up and followed by a 5-minute cool-down. Initially, the aerobic phase of the workout lasted 15 minutes. Four minutes were added to the aerobic phase each week until the total duration of aerobic exercise reached 45 minutes of stepping (week 8). A basic step aerobics program has an exercise intensity of 7 to 8.5 metabolic equivalents (METs), while travel steps and lunges are more intense (10.5-11.0

METS).¹³ Thus, we estimate that participants expended approximately 450 to 500 kcal per step aerobic workout. All participants began the class on a 10-cm step. Those who felt the need for a greater challenge were allowed to increase step height to either 15 or 20 cm at the beginning of week 5. Monitoring of heart rate¹⁴ and rate of perceived exertion were also taught.¹⁵ Initial exercise intensities and the progression of activity were consistent with recommendations of the American College of Sports Medicine.¹⁶ From weeks 14 to 16, participants were assisted in developing a long-term individualized program of structured aerobic exercise. The 2 final classes were videotaped to provide participants with copies of tapes for continued home use.

Diet and Lifestyle Activity. Participants in the lifestyle group were advised to increase their levels of moderate-intensity physical activity by 30 minutes per day on most days of the week. They were taught to incorporate short bouts of activity into their daily schedules. For example, participants were encouraged to walk instead of drive short distances and to take stairs instead of the elevator. Subjects kept daily records of their minutes of physical activity.

Participants were given 3-dimensional accelerometers (Bio-trainer; Individual Monitoring Systems, Baltimore, Md) to wear each week to provide ongoing feedback about their levels of physical activity. These monitors store units of physical activity in 20-second increments for up to 21 days and can be interfaced and downloaded to a personal computer for subsequent analysis. These devices can detect changes in the energy cost of graded walking in persons wearing them¹⁷ and yield better estimates of physical activity than what people usually self-report.¹⁸

Units of physical activity were converted to caloric expenditure. Data were downloaded, and the units were cleared each week. When a group meeting was missed, participants continued to wear the accelerometer, and data for the 2 previous weeks were downloaded at the next group meeting. Participants were provided a graph of daily activity each week at the end of their group meeting.

Dependent Measures

Weight and Body Composition.

Group leaders weighed participants weekly using a digital scale. Height was assessed with a wall-mounted stadiometer. Body composition was assessed (by a technician blinded to the participant's study group) at baseline and at week 16 by dual energy x-ray absorptiometry (Hologic QDR-2000, Hologic Inc, Waltham, Mass) whole-body scanner. Total body fat, percentage of body fat, and fat-free mass (FFM) were analyzed by use of the Hologic 7.20 whole-body scan systems software using methods previously described.¹⁹

Aerobic Fitness. Staff who assessed maximum oxygen capacity were blinded to the subject's study group. All individuals completed at baseline, week 16, and week 68, a modified Bruce protocol maximal-graded treadmill test, with heart rate and oxygen uptake monitored by a SensorMedics 2900 automated metabolic cart (Sensor-Medics Corp, Anaheim, Calif), as previously described.²⁰ The grade, speed, or both of the treadmill was increased every 3 minutes for the first 12 minutes and in 1-minute intervals thereafter, until the subject reached volitional fatigue and could not continue. This test included measures of resting and non-resting electrocardiograms, blood pressure, time of the test, and reports of the rate of perceived exertion at each stage of the treadmill assessment.

Lipids and Lipoproteins. Blood samples were drawn (at baseline, week 16, and week 68) in the morning after participants had abstained from food, beverages, or vigorous activity for 12 hours. All samples were analyzed for lipids and lipoproteins using methods recommended by the Centers for Disease Control and Prevention standardized laboratory using methods previously described.²¹

Mood. Mood was measured at baseline, week 16, and week 68 using the Beck Depression Inventory (BDI).²²

Data Analysis

A preliminary analysis showed that participants in the 2 conditions did not differ significantly in baseline measures of age, weight, fat, or FFM (TABLE 1).

We assessed changes in these variables, over time and between groups, using repeated measures analysis of variance models. Statistical analyses were performed using SPSS software.²³ The primary objective of the trial was to compare posttreatment weight change in the 2 groups. A sample size of 20 participants per group was projected to provide a power of 80% to detect a 5-kg difference in weight regain.

RESULTS

Thirty-eight (98%) of 40 women completed the 16-week study. Thirty-three (82.5%) of 40 participants completed the entire 68-week study—16 in the lifestyle group and 17 in the aerobic group (FIGURE 1). There were no differences in attendance of group treatment sessions between the conditions. Across conditions, participants attended a mean (SD) 92.2% (7.1%) of possible group meetings during the 16-week program.

Weight Losses

Weight losses of the 2 groups did not differ significantly at any time (FIGURE 2). Using a last observation carried forward analysis, we found that participants across conditions lost a mean (SD) weight of 2.2 (1.2) kg by week 4, 4.6 (1.8) kg by week 8, and 6.5 (3.0) kg at week 16. At week 16, weight loss in the lifestyle group was 7.9 (4.2) kg and in the aerobic group was 8.3 (3.8) kg (within groups, $P < .001$; between groups, $P = .08$).

Participants in the lifestyle group who were assessed at the 1-year follow-up (week 68) had regained a mean (SD)

weight of 0.08 (4.6) kg from the end of treatment while the aerobic group had regained weight of 1.6 (5.5) kg ($P = .06$).

Changes in Fat and FFM

At the end of 16 weeks, the lifestyle group reduced mean (SD) body fat by 6.2 (4.1) kg, while the aerobic group lost 7.4 (3.7) kg ($P < .001$). The percentage of body fat was reduced to 45.5% (6.2%) in the lifestyle group and to 41.9% (4.3%) in the aerobic group after 16 weeks of treatment ($P < .001$). Mean reductions in FFM were greater than 1.4 (1.3) kg for the lifestyle group compared with 0.5 (1.3) for the aerobic group ($P = .03$). Additional analyses showed that the percentage of

Figure 1. Profile of Events Throughout 68 Weeks of Treatment

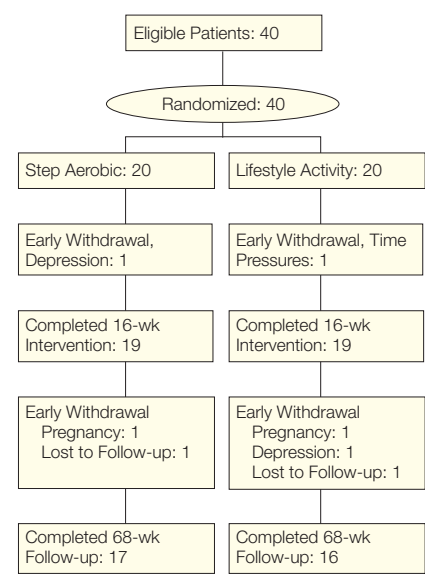


Figure 2. Mean Changes in Body Weight for the Diet Plus Lifestyle Group and Diet Plus Aerobic Group



Table 1. Baseline Characteristics of Participants in Both Conditions*

Variables	Diet Plus Lifestyle (n = 20)	Diet Plus Aerobic (n = 20)
Age, y	42.9 (7.9)	43.2 (9.1)
Weight, kg	90.5 (13.5)	83.6 (8.6)
Height, cm	167.0 (5.1)	163.3 (6.3)
BMI, kg/m ²	32.4 (4.5)	31.4 (3.7)
Fat, kg	44.4 (10.9)	39.3 (6.1)
FFM, kg	46.1 (3.8)	44.3 (4.1)
Percent fat	48.5 (4.6)	46.9 (3.6)
Age of onset of obesity, y	16.8 (6.7)	18.7 (8.8)

*Values are expressed as mean (SD). BMI indicates body mass index; FFM, fat-free mass.

weight lost from FFM was significantly ($P < .01$) less in the aerobic group (5.1% [17.0%]) than in the lifestyle group (21.3% [19%]).

Weight Loss and Physical Activity

Aerobic Group. Participants in this group attended a mean (SD) average of 87.7% (13.3%) of possible exercise classes over the 16-week program. Attendance from weeks 1 through 8 averaged 88.8% (9.2%) of possible exercise sessions, which was not different from attendance between weeks 9 and 16

(86.7% [21.6%]). The relationship between attendance of exercise sessions at week 8 and weight loss at that time was not significant ($r = 0.35$; $P = .12$), but at week 16, attendance was significantly related to weight loss ($r = 0.53$; $P = .02$).

Lifestyle Condition. During the week before treatment began, participants in the lifestyle group averaged a mean (SD) 21 769 (5186) activity units per day (U/d), which increased significantly ($P = .04$) to 24 767 (6431) activity units per day (U/d) at week 4. Activity also increased significantly ($P = .05$) from weeks 4 to 8,

at the end of which activity averaged 26 969 (6284) U/d. At week 16, activity averaged 27 381 (6676) U/d, which was not different from activity levels at week 8. Thus, by the end of 16 weeks, participants had increased their daily activity by 28.0% (23.6%). We estimate that participants increased their daily physical activity by 159 (359) kcal/d at week 4, 255 (363) kcal/d at week 8, and 234 (330) kcal/d at week 16. Participants in the lifestyle group reported participating in 30 minutes or more of activity for 4.5 (1.7), 4.8 (1.4), and 4.4 (2.1) days

Table 2. Changes in Cardiovascular Disease Risk Factors and Mood During 16 Weeks in Subjects Treated by Diet Plus Lifestyle Activity and Diet Plus Programmed Aerobic Exercise*

	Baseline	Week 16	% Change From Baseline	P Value	Week 68	% Change From Baseline	P Value
Triglycerides, mmol/L [mg/dL]							
Diet + lifestyle	1.28 (0.56) [113 (50)]	1.00 (0.37) [89 (33)]	-14.6 (32.4)	<.001	1.06 (0.58) [94 (5.1)]	-14.8 (43.9)	.31
Diet + aerobic	1.14 (0.55) [100 (49)]	0.93 (0.51) [82 (45)]	-17.9 (18.2)		1.19 (.71) [105 (63)]†	4.4 (51.4)	
Cholesterol, mmol/L [mg/dL]							
Diet + lifestyle	5.37 (1.10) [208 (45)]	4.80 (0.84) [186 (32)]	-9.3 (12.4)	<.001	5.21 (0.77) [201 (30)]	-0.8 (14.9)	<.001
Diet + aerobic	5.35 (1.15) [207 (44)]	4.75 (1.01) [184 (39)]	-10.9 (8.0)		5.23 (0.84) [202 (32)]	-0.4 (13.4)	
LDL-C, mmol/L [mg/dL]							
Diet + lifestyle	3.46 (0.84) [134 (32)]	3.15 (0.66) [122 (25)]	-6.3 (-16.9)	<.001	3.31 (0.55) [128 (21)]	-1.2 (17.6)	.27
Diet + aerobic	3.46 (1.07) [134 (41)]	3.08 (0.96) [119 (37)]	-10.7 (-11.0)		3.31 (0.91) [128 (35)]	1.3 (35.2)	
HDL-C, mmol/L [mg/dL]							
Diet + lifestyle	1.33 (0.33) [51 (13)]	1.19 (0.24) [46 (9)]	-10.3 (10.6)	<.001	1.41 (0.42) [55 (16)]†	8.3 (24.5)	.11
Diet + aerobic	1.37 (0.30) [53 (12)]	1.24 (0.34) [48 (13)]	-9.4 (13.1)		1.43 (0.41) [55 (16)]†	4.6 (17.4)	
Total cholesterol-HDL-C							
Diet + lifestyle	4.12 (0.86) [159 (33)]	4.13 (0.68) [160 (26)]	-1.90 (15.3)	.86	3.85 (0.77) [149 (30)]†	6.1 (15.5)	.03
Diet + aerobic	4.02 (0.97) [155 (38)]	4.04 (1.17) [156 (45)]	0.82 (12.6)		3.91 (1.14) [151 (44)]	4.0 (9.3)	
Resting SBP, mm Hg							
Diet + lifestyle	126.0 (16.7)	114.8 (12.3)	-7.87 (11.6)	<.001	117.7 (10.0)	-6.4 (8.4)	.008
Diet + aerobic	121.6 (17.9)	112.9 (17.2)	-6.97 (7.1)		117.5 (13.4)	-3.3 (12.3)	
Resting DBP, mm Hg							
Diet + lifestyle	79.3 (11.7)	79.7 (8.2)	2.41 (18.3)	.50	79.4 (8.0)	1.6 (14.5)	.31
Diet + aerobic	81.2 (10.3)	78.6 (10.1)	-2.89 (7.8)		80.4 (8.9)	2.7 (8.9)	
Maximum oxygen consumption, mL/kg per minute							
Diet + lifestyle	19.4 (5.5)	21.5 (4.5)	16.2 (27.6)	<.001	24.6 (6.6)†	24.2 (26.9)	<.001
Diet + aerobic	19.9 (4.0)	22.6 (3.7)	18.8 (19.2)		22.4 (4.8)	16.3 (24.0)	
Beck Depression Inventory							
Diet + lifestyle	8.3 (5.5)	3.4 (3.6)	-43.9 (87.8)	<.001	3.3 (2.2)	-41.9 (76.9)	<.001
Diet + aerobic	8.2 (5.4)	4.4 (2.9)	-15.9 (68.7)		4.0 (4.2)	-26.1 (78.2)	

*All values are expressed as mean (SD). LDL-C indicates low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; SBP, systolic blood pressure; and DBP, diastolic blood pressure. The P column represents the within-subjects effect from the repeated measures analysis of variance. No significant effects for treatment condition or treatment × condition interactions were observed.

†Different from week 16.

of the week at weeks 1, 4, and 8, respectively. They reported reaching this threshold of 4.5 (2.0) and 4.7 (1.9) days per week at weeks 12 and 16, respectively. Weight change was not significantly related to changes in physical activity at weeks 8 and 16.

Cardiovascular Risk Factors and Mood

The effects of treatment on cardiovascular disease (CVD) risk profiles are shown in TABLE 2. Significant reductions in total cholesterol, triglycerides, low-density lipoprotein cholesterol, and high-density lipoprotein cholesterol (HDL-C) levels were observed in both groups after 16 weeks of treatment. The total cholesterol-HDL-C ratio remained unchanged at week 16 but was significantly reduced in the lifestyle group at week 68. No differences were found between treatment groups in the change in serum lipid or lipoprotein levels (*P* value range, .62-.93).

Resting systolic blood pressure decreased significantly (*P* < .001) during the 16 weeks of treatment and remained lower than baseline values in the lifestyle group at week 68, but there were no significant differences between groups at any time point. There were significant improvements over time in maximum oxygen uptake (*P* < .001), with no significant differences between groups. There were no significant differences between conditions in baseline or week 16 scores on the BDI.

Weight Maintenance

After the 16-week program, participants attended 4 quarterly follow-up meetings, during which strategies for weight maintenance were discussed, and body weight was measured. At week 68, participants were asked to report the percentage of weeks that they accumulated 30 minutes or more of moderate-intensity exercise (3-5 METS, consistent with the recent report of the surgeon general³) on at least 5 days of the week during the past 12 months (ie, after the 16-week intervention).

We offered brisk walking as an example of moderate-intensity activity. During the follow-up year, the lifestyle and

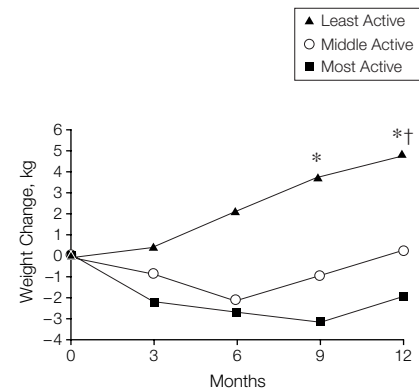
aerobic groups met the surgeon general's guidelines for a mean (SD) of 55.6 (28) and 48.2 (26) weeks, respectively. An independent *t* test revealed no difference between groups (*t* = -0.785; *P* = .44). Since there were no differences between groups in adherence to physical activity, we collapsed them together. We then divided participants who completed the 68-week trial into tertiles of self-reported levels of activity. A χ^2 analysis found no difference (χ^2 = 3.579; *P* = .17) in the proportion of patients in each treatment condition and each of the tertiles of physical activity. The most active third, which included 4 subjects from the aerobic group and 8 from the lifestyle group, reported being moderately active on most days of the week for 79.2% (13%) of the weeks in the year following the 16 weeks of treatment. The middle and least active tertiles reported being moderately active for 51.8% (10%) and 19.0% (13%) of the weeks, respectively. Weight change during the 1-year follow-up in each of the 3 groups is shown in FIGURE 3. No differences in weight regain were found between tertiles at the 3- and 6-month follow-up visits. At the 9-month visit, the least active group had regained significantly (*P* < .02) more weight (3.76 [2.4] kg) than the most active group, which, by contrast, had lost weight (-3.14 [4.6] kg).

At the 12-month follow-up, the least active group (which averaged a 4.88 [2.5] kg increase to their weight) had regained significantly more of their lost weight than the middle (0.26 [5.5] kg) *P* = .021 or the most (-1.98 [4.3] kg) active groups (*P* = .001). No differences were found between the most active and the middle group at any time during the follow-up period.

COMMENT

The principal finding of this study was that a program of diet plus lifestyle activity may offer similar health benefits and be a suitable alternative to diet plus vigorous activity for overweight women. The diet plus lifestyle program was as effective as the diet plus aerobic training program in improving weight, systolic blood pressure, and serum lipid and lipoprotein levels. This is good news for people

Figure 3. Mean Posttreatment Changes in Body Weight According to the Percentage of Weeks That Met or Exceeded the Surgeon General's Guidelines for Physical Activity in the Year After Completion of Treatment



Data shown are for the 33 patients who completed the 68-week study. The asterisk indicates significantly different from most active group (*P* < .05); the dagger, significantly different from middle active group (*P* < .05).

who understand the role of physical activity in weight control but dislike vigorous physical activity or believe that they lack time to exercise. For sedentary overweight patients, a diet combined with a lifestyle program of gradual and moderate-intensity physical activity can facilitate weight loss and enhance weight management and improve CVD risk profiles.

We found that the vigorous aerobic exercise resulted in a significantly greater sparing of lean tissue than did lifestyle activity. This demonstrates the complex interaction among weight loss, energy restriction, and physical activity. We recently examined changes in FFM in a group of 128 obese women who combined a portion-controlled 925 kcal/d diet with either aerobic, strength, or aerobic plus strength training.²⁴ Adding any 1 of these 3 modes of exercise did not spare the loss of FFM, compared with a treatment by diet alone. Thus, the favorable body composition changes observed in the aerobic group in this study may be attributable, in part, to the fact that participants followed a less restrictive diet than we used previously. We do not think that dietary compliance can explain differences in body composition changes, since we analyzed patient food

records at weeks 4, 8, 12, and 16.²⁵ No between-group differences (*P* value range, .42-.68) were observed in self-reported energy intake, which ranged from 1195 to 1265 kcal/d during the 16-week treatment trial.

Both groups in the present study demonstrated similar and significant reductions in serum lipid and lipoprotein levels. We have reported similar decreases in total cholesterol levels (15.7%) and triglyceride levels (22.7%) in women who had lost more weight and followed a more restrictive diet.²¹ We do not believe that the reduction in HDL-C levels observed in this study is cause for concern. Blood was drawn at week 16 when most participants were still trying to reduce weight. A recent meta-analysis reported that HDL-C levels decrease during weight loss but increase by 0.009 mmol/L (0.34 mg/dL) for every kilogram of decrease in body weight once patients reach a stable, reduced weight stable.²⁶

Results of the present study confirm the importance of an active lifestyle in help-

ing participants maintain their weight losses. Kayman et al²⁷ compared women who had regained their lost weight with those who were successful in maintaining their weight losses. Ninety percent of the maintainers reported engaging in regular vigorous exercise at least 3 times per week for at least 30 minutes, whereas only 34% of the regainers reported this level of activity. Pavlou et al²⁸ similarly showed that participants who exercised regularly in the 18 months following treatment maintained their weight loss significantly better than persons who did not exercise. In the present study, we found that the most active tertile of participants lost weight in the year after treatment. The middle tertile reported meeting the current surgeon general's physical activity recommendations⁵ for only 52% of the weeks in the year following treatment, but they also maintained their full end-of-treatment weight loss. Hence, patients should strive to incorporate regular physical activity into their lives on a daily basis but should realize that even some physical activity, even

if not performed regularly, is much better than being sedentary.

This study has shown that a program of diet and increased lifestyle physical activity may be a suitable alternative to diet plus aerobic exercise for overweight women. Further studies, with larger numbers of both men and women, are needed to replicate this finding and to identify persons who are best suited for lifestyle vs vigorous activity.

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