

This Weeks Question:

Which of the following recommendations best applies to a 40-year-old obese woman on a calorie-restricted diet for weight reduction?

1. High intensity exercise for at least 60 min/day will provide better weight loss than moderate intensity exercise for 60 min/day
2. Moderate intensity exercise at 30 min/day is as efficacious for weight loss as vigorous intensity exercise for the same duration
3. Moderate intensity exercise performed for less than 30 min/day is of no benefit in weight loss
4. Any exercise for any amount of time will provide significant weight loss

Sept. 9, 2003 — Moderate intensity exercise is as good as vigorous exercise for reducing weight in sedentary women, according to the results of a randomized trial published in the Sept. 10 issue of *The Journal of the American Medical Association*. A second study from the Women's Health Initiative also suggests that vigorous exercise may be no better than moderate intensity exercise in preventing breast cancer.

"Participants randomized to vigorous exercise intensity did not have greater weight loss than those randomized to a similar dose of exercise performed at a moderate intensity," write John M. Jakicic, PhD, from the University of Pittsburgh in Pennsylvania, and colleagues. "The results of this study have implications for prescription of exercise for sedentary, overweight adults engaging in weight loss efforts."

From January 2000 through December 2001, 201 sedentary, overweight women in a university-based weight control program were randomized to one of four exercise groups based on the estimated energy expenditure (1,000 kcal/week or 2,000 kcal/wk) and exercise intensity (moderate or vigorous). Moderate exercise duration was defined as about 150 min/week, and high as about 200 min/week. All women were asked to restrict energy intake to 1,200-1,500 kcal/day and dietary fat to 20% to 30% of total energy intake.

At study entry, average age was 37 years, and average body mass index (BMI) was 32.7. Of 201 women enrolled, 184 completed 12 months of treatment. Average weight loss was about 8% to 10% of baseline body weight, and it was not significantly different between groups (8.9 kg for vigorous intensity/high duration, 8.2 kg for moderate intensity/high duration, 6.3 kg for moderate intensity/moderate duration, and 7.0 kg for vigorous intensity/moderate duration).

Mean cardiorespiratory fitness levels also increased significantly in all groups, with no significant difference between groups (22.0% for vigorous intensity/high duration, 14.9% for moderate intensity/high duration, 13.5% for moderate intensity/moderate duration, and 18.9% for vigorous intensity/moderate duration).

"When data were analyzed based on the amount of exercise performed, greater levels of exercise were associated with a greater magnitude of weight loss following 12 months of treatment," the authors write. "Thus, interventions should initially target the adoption and maintenance of at least 150 min/wk of moderate intensity exercise, and when appropriate, eventually progress to exercise levels consistent with the Institute of Medicine's recommendation of 60 min/day."

The National Institutes of Health and the National Heart, Lung, and Blood Institute supported this study.

In an accompanying editorial, I-Min Lee, MBBS, ScD, from Harvard Medical School in Boston, Massachusetts, writes that these two studies suggest that "modest and achievable levels of physical activity -- 30 min/d on most days -- can decrease the risk of chronic disease including breast cancer, and coupled with appropriate dietary restraint (this is crucial), can help overweight women lose weight."

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Clinical Context

Recent recommendations from the Centers for Disease Control and Prevention and the American College of Sports Medicine have suggested a minimum of 30 minutes of moderate-intensity activity on most days of the week (150 min/week or moderate duration) to improve health and prevent cardiovascular disease and mortality. This appears to contradict the Institute of Medicine (IOM) 2002 recommendation of at least 60 min/day (high duration) of moderate-intensity exercise for most days of the week to control body weight in adults with normal BMI.

An estimated two thirds of Americans are overweight and one third are obese, making this the leading preventable cause of cardiovascular disease. Nearly three quarters of women are sedentary compared with 64% of men. However, fewer than one fifth of studies on the benefits of exercise have been conducted on women.

This randomized one-year study of 201 sedentary overweight and obese women (average BMI, 32.7) examines the effects of two levels of exercise intensity and duration on weight loss and cardiorespiratory fitness while on a calorie-restricted diet.

Study Highlights

- ? 201 overweight and obese women (BMI, 27-40) were recruited into a weight-loss program with caloric restriction of 1,200 to 1,500 kcal/day, and randomized into 4 exercise groups: (1) vigorous intensity/high duration exercise, (2) moderate intensity/high duration exercise, (3) moderate intensity/moderate duration exercise, and (4) vigorous intensity/moderate duration exercise.
- ? The study was powered at 70% at an α of 0.05 to detect a difference in outcomes between the 4 groups, assuming an attrition rate of 15%-20%.
- ? Dropout rate was low, with 184 participants completing the 12-month study.
- ? Baseline characteristics include sedentary behavior (exercise less than 3 days/week for less than 20 minutes/day over the past 6 months); mean age, 37 years; more than 50% of subjects had a college degree; most had professional or clerical/technical employment (76%); and subjects were predominantly white (81%), married (65%), and nonsmokers (92%).
- ? There was no difference in baseline characteristics among groups.
- ? The weight-loss intervention included a behavioral program with weekly meetings for 24 weeks followed by biweekly meetings, and biweekly telephone calls from month 7 to 12.
- ? The exercise prescription had walking as the primary mode of exercise, and intensity defined as vigorous or moderate by the percentage of age-predicted maximal heart rate and rating of perceived intensity on the Borg scale. Duration was defined as moderate (less than 150 min/week) or high (200 min/week or more).
- ? Participant log of food frequency and exercise duration, intensity, and type were used to track adherence to assigned protocol.
- ? Primary outcomes were weight loss, weight percentage change from baseline, and cardiorespiratory fitness measured as percentage increase in oxygen consumption

(mL/kg/min) and time to achieve 85% of maximum heart rate on a treadmill test at 6 and 12 months compared with baseline.

- ? Weight loss was significant for all groups, and at 12 months averaged 8% to 10% of baseline body weight. There was no significant effect of either duration or intensity of exercise on changes in weight or BMI among the four groups.
- ? Cardiorespiratory fitness improved for all groups at 6 and 12 months compared with baseline, with percentage improvement in oxygen consumption ranging from 14.9% to 22%, and no significant difference was seen among groups.
- ? Percentage change in cardiovascular fitness was greatest for the high duration vs. moderate duration group ($P < .007$), but exercise intensity had no effect on cardiorespiratory fitness.

Pearls for Practice

- ? Moderate and vigorous intensity exercise are equally efficacious for weight reduction and cardiorespiratory fitness in a one-year supervised weight-loss program with caloric restriction.
- ? High duration exercise (200 min/week or more) achieves greater cardiorespiratory fitness but not greater weight loss compared with moderate duration exercise (150 min/week), when combined with a calorie-reduced diet.