

set up to encourage interaction and debate. We urge readers to visit the Forum section of the Center and share their ideas for the future of American health care.

It is our hope that the entire body of work in the online Health Care Reform Center will inform the political process. Although the debate over how to repair and reinvigorate our health care

system has been lengthy and often contentious, we must find common ground and consensus. As a nation we will be far better off with meaningful health care reform than without it.

This article (10.1056/NEJMe0906792) was published on July 29, 2009, at NEJM.org.

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A Weighty Matter — Lifting after Breast Cancer

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In 1996, the *Canadian Medical Association Journal* featured a cover story entitled “Breast-cancer survivors begin to challenge exercise taboos.”¹ This story appeared during an era when lymphedema was reported in up to 62% of women treated for breast cancer, and patients were cautioned against making repetitive arm movements and lifting more than 10 to 15 lb (4.5 to 6.8 kg). The article also chronicled the fledgling research efforts of a group of Canadian investigators who were exploring progressive resistance training (exercise regimens that promote gradual increases in intensity, frequency, and load to improve muscle strength) as a means to improve physical function and the quality of life, testing the hypothesis that such exercise may actually reduce the risk of lymphedema or at least not exacerbate it.^{2,3} At that time, there was speculation about the potential benefits of progressive resistance training on the lymphatic system,⁴ yet the Canadian research was in direct opposition to clinical practice that advocated limitations on weight lifting.

The concern about weight lifting has largely been based on epidemiologic studies of women who had undergone axillary-node dissection or radiation therapy, in which significant associations between infection or injury to the affected arm and lymphedema were reported.⁵ Although injury and infection are different, they unfortunately were grouped together in the analysis. Furthermore, in translating these data to simple “patient-friendly” steps for the prevention of lymphedema, a strategy of avoidance, rather than rehabilitation, was adopted. Three widely disseminated recommendations cautioned against vigorous, repetitive arm movements (“[do not engage in] scrubbing, pushing, pulling, and hammering”), heavy lifting (“never carry heavy handbags and grocery bags . . . [and] do not lift more

than 15 pounds”), and resistance training exercises that “overtire an arm at risk.” Though the recommendations advocated exercise, suggested activities were limited to walking, swimming, light aerobics, bike riding, and “specially designed ballet or yoga.” But what should a woman do if, after her treatment, she returns home to a household of toddlers or has to push a mop for a living?

In this issue of the *Journal*, Schmitz et al.⁶ report the findings of the largest randomized, controlled trial to date (ClinicalTrials.gov number, NCT00194363) assessing whether progressive resistance training adversely affects arm and hand swelling among women with a history of breast cancer and clinically confirmed lymphedema, a group at high risk for flare. As compared with patients assigned to usual care, women assigned to twice-weekly, whole-body resistance training involving progressive weight bearing and progressive numbers of exercise sets (performed while wearing a custom-fitted compression garment) did not have a significant increase in limb swelling, and had greater improvements in self-reported severity of lymphedema symptoms and in upper- and lower-body strength as compared with controls, as well as a lower incidence of confirmed exacerbations of lymphedema.

The present report makes a substantial contribution to the available evidence to support weight-lifting intervention.⁷⁻⁹ Previous studies, most involving breast-cancer patients who did not have preexisting lymphedema, showed that progressive resistance training, or exercise regimens that included progressive resistance training, resulted in several benefits: improved flexibility, strength, physical function, and quality of life, and perhaps most surprisingly, the ability to complete the scheduled course of chemotherapy.¹⁰ None of the studies reported increases in limb volume as a re-

sult of progressive resistance training, but some of the studies were underpowered with regard to this outcome or lacked appropriate control.

The current report is distinguished from previous work not only by its larger size and longer duration (1 year), but also because its prespecified outcomes included visits for lymphedema exacerbations; there were 195 such visits among the 70 patients in the control group, as compared with 77 among the 71 patients in the weight-lifting group.

Although no cost analysis was reported, the weight-lifting intervention clearly has the potential to result in cost savings, not only by reducing direct health care costs but also by potentially reducing the risk of disability and allowing women to return to work at full capacity, either within or outside the home. Such an intervention may be particularly worthwhile in disadvantaged populations, in which the burden of lymphedema is greatest (because the stage of disease at diagnosis tends to be more advanced, requiring more aggressive treatment) and the consequences of reduced arm function may be more severe (because of the higher likelihood of manual labor-based employment and fewer economic resources to cover loss of function). The inclusion in the present study of nonwhite women and women with a broad range of occupational and educational levels suggests that the study findings are highly generalizable, supporting future investigation. Moreover, the delivery of the exercise program at YMCAs will facilitate future dissemination.

As promising as this intervention appears, critical follow-up research, including detailed cost analysis and dissemination analyses, is warranted to determine whether the intervention can be disseminated effectively or whether it will instead sit on the shelf. Such research can be difficult, especially since the intervention is behavioral in nature and therefore falls outside the purview of the pharmaceutical industry, being reliant on governmental funding.

The report by Schmitz et al. provides strong reassurance regarding the safety of appropriately supervised weight training in women with a history of breast cancer and lymphedema. A comprehensive strategy to improve the outcomes in these women should include dietary and exercise interventions aimed at weight management, since overweight, obesity, and weight gain after diagnosis are recognized as significant risk factors for

lymphedema as well as for breast-cancer-associated death.^{5,11-15} Multifactor interventions that promote healthy eating, regular exercise (e.g., aerobic and progressive resistance training), and other lifestyle improvements (e.g., reducing smoking and alcohol use) have the potential to substantially improve overall health and survival among women with this common cancer.

Dr. Demark-Wahnefried reports receiving honoraria for consulting at the Livestrong Centers for Excellence at Ohio State University and at the University of Pennsylvania. No other potential conflict of interest relevant to this article was reported.

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