

Effects of Exercise on Breast Cancer-Related Lymphedema

WOMEN WITH PRE-EXISTING LYMPHEDEMA							
Study	Design	Purpose	Participants	Intervention Description	Results	Conclusions	Comments
Schmitz et al (2009) Weight lifting for women at risk for breast cancer-related lymphedema	RCT	To assess the effects of controlled weight lifting in breast cancer survivors with lymphedema	141 female breast cancer survivors, 1-15 years since breast cancer diagnosis; patients have clinically diagnosed lymphedema. (N=141, 71 treatment group, 70 control group)	Twice weekly 90 minute sessions. First 13 weeks women were instructed; unsupervised exercise for additional 39 weeks thereafter. Behavioral support continued through weeks 14-52 Intervention incorporated: progressive upper and lower body resistance training, 'core' training, warm-up, cool-down and stretching all 52 weeks. Upper-body exercises included seated row, chest press, lateral or front raises, biceps curls, and tricep pushdowns; no upper limit placed on weight lifted as long as there were no symptom changes.	The proportion of women who had an increase of 5% or more in limb swelling was similar in the weight-lifting group (11%) and the control group (12%); The treatment group had greater improvements in self-reported severity of lymphedema symptoms (P = 0.03) and upper- and lower-body strength (P<0.001 for both comparisons) and a lower incidence of lymphedema exacerbations (14% vs. 29%, P = 0.04).	No adverse events related to increased limb swelling; weight-lifting program resulted in a decreased incidence of exacerbation of lymphedema, reduced the number and severity of arm and hand symptoms, and increased strength.	All women required to wear a custom fitted compression garment during exercise
McKenzie et al (2003) Effect of upper extremity exercise on secondary lymphedema in breast cancer patients	Pilot Study	To examine the effect of a progressive upperbody exercise program on lymphedema secondary to breast cancer treatment	14 female breast cancer survivors, 6+ months since breast cancer diagnosis, all with clinically diagnosed lymphedema; (N=14, 7 treatment group, 7 control group)	Exercise sessions occurred 3 times per week for 8 weeks. All sessions were supervised. Sessions incorporated progressive upper body resistance training, warm-up, cool-down and stretching performed all 8 weeks. Arm ergometry added weeks 3-8. Upper-body exercises included: seated row, bench press, latissimus dorsi pull down, one arm bent-over rowing, tricep extension, and bicep curl.	No changes found in arm circumference or arm volume as a result of the exercise program. Three of the SF-36 domains showed trends toward increases in the exercise group: physical functioning (P =.050), general health (P =.048), and vitality (P=.023). Mental health increased for all subjects, although not significantly (P =.019).	No changes in arm circumference or arm volume after participating in an 8-week upper-body exercise program. Participation may lead to an increase in quality of life.	All women required to wear a custom fitted compression garment daily and during exercise
Hayes et al (2009) Exercise and Secondary Lymphedema: Safety, Potential Benefits, and Research Issues	Single-Blind RCT	To assess the immediate and longer-term effect of participating in a supervised, mixed-type exercise program on lymphedema status among women with lymphedema secondary to breast cancer	Survivors with clinically diagnosed lymphedema, 6+ months since breast cancer diagnosis; (N=32, 16 intervention group, 16 control group)	Weeks 1-2 included aerobics only; weeks 3-4 aerobics and water based resistance training; weeks 5-8 aerobics, water based resistance training, free weights; weeks 9-12 aerobics and machine based resistance training. A total of 20 sessions were supervised. Sessions progressed from 3 times per week, 20-30 min./session during weeks 1-4 to 4 times a week 45+ /session throughout weeks 9-12.	No group changes were observed in lymphedema status over the study period for either group. Although no group change was observed, 2 women in the treatment group no longer had evidence of lymphedema by study end.	Participation in an exercise program appears safe for those with upper-limb lymphedema, and that at minimum, exercise does not appear to exacerbate lymphedema related swelling. Results from this study suggest that women with secondary lymphedema should be encouraged to be physically active, optimizing their physical and psychosocial recovery	
WOMEN AT RISK FOR LYMPHEDEMA							
Lane et al (2005) The effect of a whole body exercise programme and dragon boat training on arm volume and arm circumference in women treated for breast cancer	One-group, pretest-posttest study	To examine the effect of a progressive, whole body exercise program, and dragon boat training on both upper extremity volume and circumference in breast cancer survivors with no clinical history of lymphedema.	16 women diagnosed with breast cancer, all with no history of lymphedema and 6+ months post-treatment. (N=16)	20-week exercise program. Resistance training was completed 3 times per week, exercises included: seated row, bench press, latissimus dorsi pull down, one arm bent-over rowing, triceps extension, and biceps curl. Aerobic training of the participants' choice was completed 3 days per week for 30-45 min./session at an intensity of 60% maximal effort. Dragon boat training was introduced at week 8. Only the dragon boat training was supervised.	Arm circumference, arm volume, and upper body strength (1-RM) showed significant increases throughout the program.	These results suggest that women treated for breast cancer may be able to participate in upper extremity resistance training without precipitating lymphedema.	The increases observed were thought to have resulted from muscle hypertrophy because there were no significant differences between the affected and unaffected upper extremities