
**Context** Clinical guidelines for breast cancer survivors without lymphedema advise against upper body exercise, preventing them from obtaining established health benefits of weight lifting.

**Objective** To evaluate lymphedema onset after a 1-year weight lifting intervention vs no exercise (control) among survivors at risk for breast cancer–related lymphedema (BCRL).

**Design, Setting, and Participants** A randomized controlled equivalence trial (Physical Activity and Lymphedema trial) in the Philadelphia metropolitan area of 154 breast cancer survivors 1 to 5 years postunilateral breast cancer, with at least 2 lymph nodes removed and without clinical signs of BCRL at study entry. Participants were recruited between October 1, 2005, and February 2007, with data collection ending in August 2008.

**Intervention** Weight lifting intervention included a gym membership and 13 weeks of supervised instruction, with the remaining 9 months unsupervised, vs no exercise.

**Main Outcome Measures** Incident BCRL determined by increased arm swelling during 12 months (≥5% increase in interlimb difference). Clinician-defined BCRL onset was also evaluated. Equivalence margin was defined as doubling of lymphedema incidence.

**Results** A total of 134 participants completed follow-up measures at 1 year. The proportion of women who experienced incident BCRL onset was 11% (8 of 72) in the weight lifting intervention group and 17% (13 of 75) in the control group (cumulative incidence difference [CID], −6.0%; 95% confidence interval [CI], −17.2% to 5.2%; *P* for equivalence=.04). Among women with 5 or more lymph nodes removed, the proportion who experienced incident BCRL onset was 7% (3 of 45) in the weight lifting intervention group and 22% (11 of 49) in the control group (CID, −15.0%; 95% CI, −18.6% to −11.4%; *P* for equivalence=.003). Clinician-defined BCRL onset occurred in 1 woman in the weight lifting intervention group and 3 women in the control group (1.5% vs 4.4%, *P* for equivalence=.12).

**Conclusion** In breast cancer survivors at risk for lymphedema, a program of slowly progressive weight lifting compared with no exercise did not result in increased incidence of lymphedema.


1. **Lymphatic sparing procedures such as sentinel lymph node biopsy:**
   A. eliminate the possibility of breast cancer-related lymphedema.
   B. do not eliminate the possibility of breast cancer-related lymphedema.
   C. eliminate the possibility of women returning to a previous level of fitness.
   D. do not allow for the possibility of women exceeding previous levels of fitness.

2. **Activity avoidance in cancer survivors is:**
   A. the best way to avoid the onset of lymphedema.
   B. one way to avoid cancer recurrence.
   C. going to lead to deconditioning.
   D. will improve survival rates.
3. The purpose of this study was to:
   A. promote weight lifting as a means of preventing cancer.
   B. evaluate the incidence of lymphedema from weight lifting.
   C. evaluate the results of the Physical Activity and Lymphedema trial.
   D. assess the effects of weight lifting on women without lymphedema.

4. Which of the following was NOT included as an eligibility requirement for women in this study?
   A. Non-metastatic breast cancer diagnosis between 1 and 5 years before study.
   B. Currently weight lifting or has been weight lifting in the last year.
   C. No prior lymphedema diagnosis.
   D. Currently cancer free.

5. What were the subjects required to wear during the intervention phase of this study?
   A. Custom-fitted compression garment.
   B. Off-the-shelf compression garment.
   C. Loose fitting clothing.
   D. Cotton clothing.

6. To ensure that arm swelling changes were detected how often did trainers check participants?
   Asked ____________________ and measured ____________________.
   A. weekly, weekly
   B. weekly, monthly
   C. monthly, weekly
   D. monthly, monthly
7. One of the results of the study was that women in the weight lifting intervention group:
   A. had no difference in strength compared to the no exercise group.
   B. declined slightly in strength compared to the no exercise group.
   C. were equal in strength to the no exercise group.
   D. became stronger than the no exercise group.

8. This study demonstrated that among high risk women, exercise (weight lifting):
   A. can reduce the likelihood of increased arm swelling.
   B. is too risky to attempt after breast cancer treatment.
   C. did not change the chances of developing arm swelling.
   D. should not be started for at least 5 years after cancer treatment.

9. In this study, how many pounds were the weights that participants started with in their training?
   A. 10
   B. 6-8
   C. 3 - 5
   D. 1 – 2

10. How many times a week did participants lift weights and how long did participants remain in the study? _____________ times per week and ______________years in the study.
    A. 5 and 1
    B. 2 and 1
    C. 1 and 5
    D. 1 and 2