Strength After Breast Cancer

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NCI R21-CA152451, NCI R01-106854, NCI U54-155850
WTBS

- RCT on weight training for breast cancer survivors
  - With lymphedema (n=14)
  - At risk for lymphedema (n=71)
- Intervention at UMN University Recreation Center
  - 2 x weekly, 6 months
  - 13 weeks supervised
- Lymphedema outcome
  - Weight training conferred NO RISK of lymphedema onset/worsening (Ahmed et al. JCO 2006)

Susan G. Komen Foundation grant # BCTR0100442
PAL Trial

• One year long RCT on weight training for breast cancer survivors
  – With lymphedema (n=141)
  – At risk for lymphedema (n=154)
  – 35% of participants were black women

• Intervention at YMCAs with YMCA staff
  – 2x weekly weight-lifting
    • 3 months supervised
    • 9 months unsupervised

• Training intervention staff
  – 3 days, 24 hours
  – 17 fitness staff trained
  – 8 YMCA Fitness Centers
  – Intervention fidelity monitored
Weight Lifting for Women at Risk for Breast Cancer–Related Lymphedema: A Randomized Trial

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MORE THAN 2.4 MILLION breast cancer survivors live in the United States. Lymphedema remains high among these survivors because it causes swelling and disfigurement, impairs arm function and quality of life, and increases healthcare costs. Lymphedema is a frequent complication among survivors, despite prophylactic prophylactic procedures such as sentinel lymph node biopsy. Of the 92 patients who underwent sentinel lymph node biopsy, 5% of patients who underwent sentinel lymph node biopsy 6% to 7% developed breast cancer–related lymphedema, 9 however, one-third of patients with breast cancer require complete adjuvant chemotherapy, which is associated with 17% to 30% incidence of lymphedema.

Breast cancer survivors at risk for lymphedema after activity, limit activity, or both from fear and uncertainty about their personal risk level, and upper guidance advising them to avoid lifting, bending, heavy bags, or other objects with the at-risk arm. Such guidance is often interpreted in a manner similar to “no strenuous activity.”

Context: Clinical guidelines for breast cancer survivors with 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 weightlifting intervention vs. a usual care (control) among survivors at risk for breast cancer–related lymphedema (BCL).

Design, Setting, and Participants: A randomized controlled equivalence trial of physical activity and lymphedema trial in the Philadelphia metropolitan area of 13 breast cancer survivors with unilateral breast cancer, with more lymph nodes removed and without clinical signs of BCL. Study entry Participants were recruited between October 1 and February 2005, with data collection ending in August 2008.

Intervention: Weight lifting intervention included a gym membership and 43 weeks of supervised instruction, with the remaining 5 months unsupervised, exercise.

Main Outcome Measures: Incident BCL, determined by increased arm swelling during 12 months (40% increase in manual difference). Clinician-defined BCL onset was also evaluated. Equivalence margins were defined as doubling of lymphedema incidence.

Results: A total of 103 participants completed follow-up measures at 1 year. The proportion of women who experienced incident BCL onset was 1.2% (9 of 72) in the weight lifting intervention group and 1.2% (9 of 72) in the control group (cumulative incidence difference [CIDI]: -0.2%; 95% confidence interval [CI]: -1.3% to 0.9%; P for equivalence = 0.84). Among women with 5 or more lymph nodes removed, the proportion of patients with incident BCL (8% of 48) in the weightlifting intervention group and 22% (11 of 50) in the control group (CIDI: -11.4%; 95% CI: -24.3% to 1.5%; P for equivalence = 0.03). Clinician-defined BCL occurred in 1.1% (8 of 72) in the weight lifting intervention group and 3.3% (2 of 50) in the control group (CIDI: -1.0%; 95% CI: -5.6% to 3.6%; P for equivalence = 0.58).

Conclusion: In breast cancer survivors at risk for lymphedema, a program of strength and progressive resistance training compared with no exercise did not result in increased incidence of lymphedema.

Trial Registration: clinicaltrials.gov Identifier: NCT00916332

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Changes in lymphedema with or at risk: A one-year study

Rebecca M. Speck · Rehana L. Ahmed · Kathryn H. Schmitz

Impact of Lymphedema and Arm Symptoms on Quality of Life in Breast Cancer Survivors


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Influence of weight training on skeletal health of breast cancer

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The latest version is at http://jco.ascopubs.org/cgi/doi/10.1200/JCO.2014.57.7395

Weight Lifting and Physical Function Among Survivors of Breast Cancer: A Post Hoc Analysis of a Randomized Controlled Trial

Justin C. Brown and Kathryn H. Schmitz
Summary of Findings

- Risk of lymphedema flare-ups decreased by HALF (Schmitz et al. NEJM 2009)
  - Cost effectiveness?
- Among at-risk women with 5+ nodes removed, risk of ↑ arm swelling is reduced by 70% (Schmitz et al. JAMA 2010)
- Significant improvements in upper body symptoms (ibid)
- Substantive strength improvements (ibid)
- Prevented declines in physical function (Brown et al. 2015 JCO)
- Body image improved as well (Speck et al. 2010 Br Cancer Res Treat)
Ensuring Safety of Participants

- Telephone pre-screening for eligibility
- Hour long educational lecture for all participants
- In-person pre-exercise evaluation by
  - Trained research measurement staff
  - Certified lymphedema therapists if needed
- Provision of FREE custom fitted compression garments (2x)
- Written physician clearance
- Very specific protocol for progression
- Ongoing monitoring of symptoms by
  - Trainers
  - Measurement staff
- Obvious centralized system for referring women back to FREE PT evaluation and treatment

Who would do this outside of the realm of a research study? There is no infrastructure for this within clinical setting OR fitness centers.

- Measurement staff
- Obvious centralized system for referring women back to FREE PT evaluation and treatment
Revised Intervention: Strength After Breast Cancer

• Referral from Oncology clinician
• Evaluation with a PT
• Education session
• 4 group PT sessions to learn the protocol
• Choice:
  – Home equipment
  – YMCA membership
• Choice of self-pay or insurance co-pay
Trainings

• Oncology clinicians
  – Set up automated EMR script

• Physical Therapists
  – 2-6 hour training
    • Education session
    • Evaluations
    • Group exercise sessions
### Safety and effectiveness: SABC vs. PAL

<table>
<thead>
<tr>
<th>Safety and Effectiveness Outcomes</th>
<th>Strength After Breast Cancer Effectiveness Trial</th>
<th>Physical Activity after Lymphedema Efficacy Trial (5, 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of symptoms</td>
<td>Baseline 2.6±2.6 12-month 1.7±2.1 P&lt;.002</td>
<td>Baseline 3.3±3.2 12-month 2.2±2.6 P&lt;.001</td>
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<tr>
<td>Severity of symptoms</td>
<td>Baseline 1.6±0.5 12-month 1.4±0.5 P&gt;.058</td>
<td>Baseline 2.0±0.7 12-month 1.6±0.7 P&lt;.001</td>
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<tr>
<td>Arm Volume (% interlimb difference)</td>
<td>Baseline 0.68±5.87 12-month 0.66±5.07 P&gt;.058</td>
<td>Baseline 7.22±12.40 12-month 6.84±11.66 P&gt;.40</td>
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| Lymphedema Safety Outcomes       |                                              |                                                  |
|----------------------------------|                                              |                                                  |
| New lymphedema onset             | —                                             | 4 (8%)                                          |
| Flare-up of existing lymphedema  | —                                             | 5 (19%)                                         |

| Muscular Strength Outcomes       |                                              |                                                  |
|----------------------------------|                                              |                                                  |
| Bench press (lbs)                | Baseline 45±11 12-month 51±13 P<.001          |                                                  |
| Leg press (lbs)                  | Baseline 190±58 12-month 208±54 P>.012        |                                                  |

| Body Image and Relationships     |                                              |                                                  |
|----------------------------------|                                              |                                                  |
| Strength and health              | Baseline 34.2±9.2 12-month 28.7±9.3 P<.001    |                                                  |
| Social barriers                  | Baseline 19.8±7.0 12-month 17.0±6.3 P>.003    | 16.6±6.3 P>.01                                  |
| Appearance and sexuality         | Baseline 30.8±6.7 12-month 27.7±7.2 P<.001    | 30.0±8.0 12-month 27.0±8.0 P<.001                |
| Total score                      | Baseline 85.8±19.9 12-month 74.0±20.3 P<.001  | 81.2±20.2 12-month 70.0±19.1 P<.001              |

Beidas et al. JNCI 2014
Qualitative Evaluation of Implementation (CFIR)

• Intervention characteristics
  – Group PT does not work – changed to individual PT

• Outer Setting
  – Patients don’t view exercise like medicine
  – Cost & location are major issues
    • insurance coverage vital

• Inner Setting
  – Clinicians had difficulty finding time to make referrals
  – Confusion regarding referral process
  – Active follow-up from PT clinic was crucial

• Implementation approach
  – Champions are crucial
PAL is now a clinical program called Strength ABCs

- Paid for by
  - Private insurance
  - Medicare and Medicaid
- Available at multiple locations
After Referral to Outpatient Rehabilitation

Visit 1
PT Evaluation And Clearance

Visit 2
Lymphedema Education Session

Visit 3
Teach Warm-up, cool down, teach 2-3 exercises

Visit 4
Have pt repeat Visit 3 activities, answer questions, teach 2-3 exercises

Visit 5
Have pt repeat visit 4 activities, answer questions, teach 2-3 exercises

Visit 6
Discharge Day
Pt. demonstrates complete protocol.

Discharge may only occur when the pt demonstrates understanding of:
1. Good form with exercises
2. Progression
3. Deconditioning
4. Overall arm work
5. Monitoring symptoms
6. When to call for a follow-up appt

Additional visits will be scheduled for pts not ready for discharge at visit 6.

Home Exercise

2x weekly Practice warm-up, cool down, and 2-3 exercises until visit 4

2x weekly Practice warm-up, cool down, and 5-6 exercises until visit 5

2x weekly Practice warm-up, cool down, and 8-10 exercises until visit 6

2x weekly Full protocol, on an ongoing basis, monitoring for symptom changes

Resistance delivered to home or purchased by patient.

Home Exercise Continues 2x weekly
Patient calls PT for evaluation upon noticing any change in symptoms that lasts a week or longer.
Training for Strength ABCs now online

- Partnership with Klose Training and Consulting
- 387 have purchased the training!
- $125 for 4 hour training
Future Directions

• D&I research to compare  (R01 CA221288-01 pending IRG review)
  – Strength ABCs
  – Strength and Courage DVD

• Exercise Medicine Unit at PSCI
  – ENACT trial
    • D&I research on exercise during chemotherapy
Thank you!

Questions?
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