A Manual Therapy and Exercise Approach to Breast Cancer Rehabilitation Course

Exercise for Breast Cancer Patients:
Evidence and Special Considerations

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Exercise plays a critical role in recovery and wellness during and after breast cancer.
Benefits of Exercise

- Reduces your risk of heart disease, high blood pressure, osteoporosis, diabetes and obesity
- Keeps joints, tendons and ligaments flexible
- Reduces some of the effects of aging
- Contributes to your mental well-being and helps treat depression
- Helps relieve stress and anxiety
- Increases your energy and endurance
- Helps you sleep better
- Helps you maintain a normal weight by increasing your metabolism
Benefits of Exercise Specific to Breast Cancer

- Decreased Risk of Recurrence
- Decreased Fatigue / Anemia
- Decreased Severity of Nausea
- Maintenance of Bone Mineral Density
- Improved Body Composition
- Increased Quality of Life
- Decrease Pain
- Reduction/Prevention of Lymphedema
Exercise reduces risk of recurrence following breast cancer.
Physical Activity and Risk of Breast Cancer Recurrence
Holmes, MD, 2004

Subjects:
2,167 women with stages I-III breast cancer (part of the nurses health study)

Design and Variables:
RETROSPECTIVE REVIEW
Activity level in hours per week; number of cases of BC recurrence

Conclusions:
• Moderate physical activity (1-3 hours/wk, at 3 miles/hour) decreased risk by 25%
• Increase in activity (3-8 hours/wk) decreased risk by 50%
Exercise Reduces Fatigue in Patients with Cancer
Cancer Related Fatigue:

- One of most debilitating and common side effects associated with cancer and its treatment
- Fatigue is reported consistently in literature as contributing to reduced quality of life
- Education, exercise and lifestyle advice can reduce the impact of fatigue.
Cancer-Related Fatigue

- One of most debilitating and common side effects associated with cancer and its treatment

- Fatigue contributes to reduced quality of life

- The National Comprehensive Cancer Network (NCCN) defines cancer-related fatigue as a “distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to activity and that interferes with usual functioning”
Exercise for the management of cancer-related fatigue in adults

- A review of RCT’s that investigated the effects of physical activity in reducing cancer related fatigue
- Two review authors independently assessed the risk of bias of studies and extracted data based upon predefined criteria
- At the end of the intervention period aerobic exercise was seen to be statistically more effective than the control intervention
- Benefits of exercise on fatigue were observed for interventions delivered during or post-adjuvant cancer therapy
Several distinct patterns of fatigue:
  - Most common pattern of fatigue - after chemo had a sharp rise in fatigue
  - Several women had a chaotic pattern with erratic swings in their fatigue throughout study period

Women who adopted exercise had:
  - fewer days of high fatigue levels and
  - lower levels of fatigue for both average & worst days of fatigue.
Sleep quality, fatigue and physical activity following a cancer diagnosis.

- Breast (BC) and Prostate (PC) cancer survivors in study
- 57.8% reported poor sleep quality
- 65% of the BC survivors reported high levels of fatigue
- Those with poorer sleep quality reported higher levels of fatigue.
- Participants who reported no physical activity had significantly greater fatigue than those who reported high levels of physical activity.
Exercise reduces nausea during breast cancer treatment.
Exercise during adjuvant chemotherapy cancer treatment decreases nausea.
Lee J and Dodd M. Oncology Nursing Forum. 2007.

- Subjects: 112 breast cancer patients, Stages I-III, receiving chemo (98 AC)
- Intervention: Moderate to somewhat hard intensity aerobic ex, at least 20 min, at least 3x/week
- Results: Decreased nausea severity following final cycle of chemo vs. control group
Exercise Minimizes Bone Loss
Possible Causes of Cancer-Related Osteoporosis and Bone Fractures

- Some chemotherapy drugs can decrease calcium levels in the body
- Radiation therapy to the pelvic region, especially for women over the age of 65
- Spread (metastasis) of cancer to the bone from the original tumor site
- Hormone therapy in BC patients with aromatase inhibitors
- Steroid treatments
Exercise effects on bone mineral density in women with BC receiving chemotherapy. Schwartz AL. Oncology Nursing Forum. 2007.

- Subjects: Stages I-III, during chemo, over 12 week period
- Intervention: Aerobic Ex, Resistance Ex and Usual Care Groups
- Aerobic Ex: self-selected walking or jogging, 15-30 minutes, 4 days per week
- Resistance Ex: 8 exercises with theraband, 2 sets of 10, 4 days per week
Exercise effects on bone mineral density in women with BC receiving chemotherapy. Schwartz AL. Oncology Nursing Forum. 2007.

- Results: Premenopausal women had greater bone loss than post menopausal women.
- Decline in BMD was least in aerobic ex group (-0.8%), next in resistance (-4.9%) and greatest in usual care (-6.23%).
- Note: aerobic exercise was weight bearing exercise.
The Effects of Exercise on Weight Gain and Body Composition
Weight Gain and Breast Cancer

- 60% of breast cancer patients report weight gain, 26% weight loss and 14% no change
- Factors associated with weight gain:
  - Chemotherapy
  - African-American ethnicity
  - Energy intake
  - Postmenopausal status

Rock et al, 1999; Saquib, 2007
Weight Fluctuations with Cancer Treatment

- Some patients find their weight does not change during treatment.
- Some patients lose weight from nausea and loss of appetite.
- Some may gain weight and this is particularly true for patients with cancer of the breast and ovary who are taking certain medications or who are on hormone treatments or chemotherapy.
Exercise and weight gain in breast cancer patients receiving chemotherapy
Schwartz AL, Cancer Practice, 2000

- 78 women; Home-based exercise during 1\textsuperscript{st} 4 cycles of adjuvant chemo
- Women who adhered to exercise program maintained their body wt
- **Non-exercises steadily gained wt (P < .05).**
- no significant differences in incidence or intensity of nausea or anorexia exercisers vs. nonexercisers.
- **Women who exercised over 4 cycles chemo improved their fx. ability (mean 23%) vs. non-exercisers significant declines in fx. ability (mean -15%).**
Effects of aerobic and resistance exercise in breast cancer patients receiving adjuvant chemotherapy.

Courneya KS, Segal RJ. J Clin Onc. 2007

- 242 patients participated
- 3 groups: aerobic exercise, supervised resistance exercise and usual care
- Duration of chemo (mean - 17 weeks)
- No new cases of lymphedema or other adverse events
- Both exercise groups increased self-esteem
Effects of aerobic and resistance exercise in breast cancer patients receiving adjuvant chemotherapy.

Courneya KS, Segal RJ. J Clin Onc. 2007

Aerobic Exercise Group
- Increased cardiovascular fitness
- Decreased % body fat

Resistance Exercise Group
- Increased mm. strength
- Increased lean body mass
- Increased chemotherapy completion rate
The Effects of Exercise on Lymphedema
Weight Lifting in Women with Breast-Cancer-Related Lymphedema.

- 141 BC survivors with stable Lymphedema
- One year exercise program – supervised for the first 13 weeks
- Ex Program included stretching, CV warm-up, abs and back ex + weight-lifting.
- Slow progression with no upper limit
- Custom-fitted Jobst sleeves were worn during exercise sessions.
Weight Lifting in Women with Breast-Cancer-Related Lymphedema.

Results: weight lifting group showed-
• decrease severity of Lymphedema symptoms
• increased upper and lower body strength
• lower incidence of Lymphedema exacerbations

Conclusion: Slowly progressed wt lifting program had no effect on limb swelling and resulted in decreased LE symptoms and exacerbations.
Weight Lifting for Women at risk for Breast-Cancer-Related Lymphedema.

- As part of the same study, 134 patients at-risk for BCRL participated in either the exercise or the control group.

RESULTS:
- For those with >5 nodes removed: 7% of wt lifters and 22% of control group experienced an incident of swelling. Clinician defined BCRL was only found in 1 wt lifter and 3 control group participants.

Conclusion: Slowly progressive weight lifting did not increase the incidence of lymphedema!
The effect of a whole body ex program and dragon boat training on arm volume in women treated for breast cancer.


- 16 bc survivors without lymphedema
- 20 weeks of aerobic and resistance ex
- Added dragon boat training at week 8
- All women increased in mm. strength, no new cases of lymphedema
Exercise Improves Quality of Life in Women following Breast Cancer
Design:

SYSTEMATIC REVIEW

Literature Search and Critical Review of studies that met criteria of involving designs with exercise to increase cardiovascular and/or muscular fitness in patients with cancer

24 studies found that met criteria

14/24 studies involved Stage I and II Breast Cancer patients; 7 studies carried out during adjuvant treatment; 11 studies post-treatment

Exercise:

Bicycle (n=8), Walking (n=6), mainly supervised, some home

3-5 days/wk, 20-60 minutes at 60-90% max HR

Measures:

Functional Capacity, walk tests, strength, flexibility, QOL, FACT-B...
RESULTS:

89% of intervention studies had statistically significant positive results of exercise in patients with cancer. The following benefits of exercise have been documented repeatedly in the literature:

**Increased/improved:**
- Functional capacity
- Muscle strength
- Flexibility
- Hematological indices, natural killer cell activity
- Self-esteem
- Mood
- Quality of Life
- Satisfaction with Life

**Decreased:**
- Fatigue
- Nausea and diarrhea
- Pain

Literature review regarding the benefits of exercise for breast cancer survivors:

- Improved fitness
- Decreased fatigue
- Improved management of body size
- Improved quality of life
Physical Activity
Current Recommendations

- The National Comprehensive Cancer Network recommends activity enhancement, including programs that encompass endurance and resistance exercise during active treatment and post treatment, to combat cancer-related fatigue. NCCN Practice Guidelines in Oncology Cancer-related fatigue. 2010

- The American Cancer Society Guidelines recommend regular physical activity, avoid inactivity and return to normal daily activity as soon as possible following diagnosis, aim to exercise 150 minutes/week, include strength training exercises at least 2 days/week. Guidelines for physical activity in cancer survivors April 2012

- The American College of Sport Medicine published a consensus statement and recommendations for cancer survivors endorsing the U.S. Department of Health and Human Services general population recommendations for a minimum of 150 minutes of moderate or 75 minutes of vigorous exercise per week, stretching, and 2 or 3 weekly strength training sessions for major muscle groups. American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. Med Sci Sports Exerc 2010; 42: 1409–26
# Review of the Physical Activity Guidelines (PAG) for Americans and Alterations needed for Cancer Survivors

<table>
<thead>
<tr>
<th>General statement</th>
<th>Breast</th>
<th>Prostate</th>
<th>Colon</th>
<th>Adult Hematologic (No HSCT)</th>
<th>Adult HSCT</th>
<th>Gynecologic</th>
</tr>
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<tbody>
<tr>
<td>Avoid inactivity; return to normal daily activities as quickly as possible after surgery. Continue normal daily activities and exercise as much as possible during and after nonsurgical treatments. Individuals with known metastatic bone disease will require modifications to avoid fractures. Individuals with cardiac conditions (secondary to cancer or not) may require modifications and may require greater supervision for safety.</td>
<td>Avoid inactivity; return to normal daily activities as quickly as possible after surgery. Continue normal daily activities and exercise as much as possible during and after nonsurgical treatments. Individuals with known metastatic bone disease will require modifications to avoid fractures. Individuals with cardiac conditions (secondary to cancer or not) may require modifications and may require greater supervision for safety.</td>
<td>Recommendations are the same as age-appropriate guidelines from the PAG for Americans.</td>
<td>Recommendations are the same as age-appropriate guidelines from the PAG for Americans.</td>
<td>Ok to exercise everyday; lighter intensity and lower progression of intensity recommended.</td>
<td>None</td>
<td>Recommendations are the same as age-appropriate guidelines from the PAG for Americans.</td>
</tr>
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<tr>
<th>Aerobic exercise training (volume, intensity, and progression)</th>
<th>Be aware of fracture risk.</th>
<th>Be aware of increased potential for fracture.</th>
<th>Physician permission recommended for patients with an ostomy before participation in contact sports (risk of blow).</th>
<th>Recommendations are the same as age-appropriate PAG.</th>
<th>None</th>
<th>Recommendations are the same as age-appropriate PAG.</th>
</tr>
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<tbody>
<tr>
<td>Cancer site-specific comments on aerobic exercise training prescriptions</td>
<td>Altered recommendations. See below.</td>
<td>Recommendations are the same as age-appropriate PAG.</td>
<td>Recommendations are the same as age-appropriate PAG.</td>
<td>None</td>
<td>None</td>
<td>None</td>
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<td>Resistance training (volume, intensity, and progression)</td>
<td>Start with a supervised program of at least 16 sessions and very low resistance; progress resistance at small increments. No upper limit on the amount of weight to which survivors can progress. Watch for arm/shoulder symptoms, including lymphedema, and reduce resistance or stop specific exercises according to symptom response. If a break is taken, back off the level of resistance by 2 wk worth for every week of no exercise (e.g., a 2-wk exercise vacation = back off to resistance used 4 wk ago). Be aware of risk for fracture in this population.</td>
<td>Add pelvic floor exercises for those who undergo radical prostatectomy. Be aware of risk for fracture.</td>
<td>Recommendations are the same as age-appropriate PAG.</td>
<td>Recommendations are the same as age-appropriate PAG.</td>
<td>None</td>
<td>Resistance training might be more important than aerobic exercise in bone marrow transplant patients. See text for further discussion on this point.</td>
</tr>
<tr>
<td>Cancer site-specific comments on resistance training prescription</td>
<td>Recommendations are the same as age-appropriate PAG for Americans.</td>
<td>Recommendations are the same as age-appropriate PAG for Americans.</td>
<td>Recommendations are the same as age-appropriate PAG, with care to avoid excessive intra-abdominal pressure for patients with ostomies.</td>
<td>Recommendations are the same as age-appropriate PAG for Americans.</td>
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<tr>
<td>Flexibility training (volume, intensity, and progression)</td>
<td>Research gap</td>
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<td>Exercises with special considerations (e.g., yoga, organized sports, and Pilates)</td>
<td>Yoga seems safe as long as arm and shoulder morbidities are taken into consideration. Dragon boat racing not empirically tested, but the volume of participants provides face validity of safety for this activity. No evidence on organized sport or Pilates.</td>
<td>Research gap</td>
<td>If an ostomy is present, modifications will be needed for swimming or contact sports.</td>
<td>Research gap</td>
<td>Research gap</td>
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**Medicine & Science in Sports & Exercise**

[Image] Wolters Kluwer | Lippincott Williams & Wilkins
Exercise and Metastatic Cancer
Role of Rehabilitation for Individuals with Metastatic Cancer

The following are some of the issues that impact quality of life

- Physical and emotional impacts of ongoing treatment
  - Pain
  - Neuropathy
  - Weakness
  - Osteoporosis and compression fracture
  - General deconditioning
- Unrelated issues of pain, musculoskeletal dysfunction and weakness are often not addressed
- Relationship issues, fear and isolation can impact quality of life
Aerobic exercise for a patient suffering from metastatic bone disease.


- Case report (n=1), 48 y.o.
- Metastatic breast cancer with lung, liver and extensive skeletal mets
- Intervention: stationary bike at 60% max HR, 3x/week, 30-50 min/session, 1 year. Patient exercised as part of an outpatient exercise group for cancer patients.
Aerobic exercise for a patient suffering from metastatic bone disease.

- Results: \( \uparrow \) VO2 max, \( \uparrow \) work capacity, \( \uparrow \) quality of life, \( \downarrow \) fatigue, improved sleep
- Conclusion: stationary bicycling at low to moderate intensity was safe and practical for patient with advanced breast cancer. Similar benefits to patients in Stages I-III.
The effect of seated exercise on fatigue and QoL in women with advanced breast cancer.

- RCT (n=32); Stage IV pts during chemo
- Exercise group used the “Armchair Fitness” video; control did not exercise
- 30 min., 3x/week, low to mod intensity
- No equipment, no resistance
- FACIT-F: functional assessment of chronic illness therapy – fatigue version

Women in the exercise group showed:

- Slower decline in total well-being
- Slower decline in physical well-being
- Less increase in fatigue

Many participants reported that the exercises were not challenging enough or were not motivating.
Functional benefits are sustained after a program of supervised resistance exercise in cancer patients with bone metastases: longitudinal results of a pilot study.


- Subjects: 20 men and women with bone metastatic disease secondary to prostate or breast cancer
- Intervention: 3-month supervised resistance exercise program followed by a 6-month observation period. Outcomes were assessed at baseline, post-exercise, and 6-month follow-up
- Fourteen participants completed the follow-up observation period.
- Significant improvements in physical function, physical activity levels (~160 min/week), lean mass, and quality of life were observed at the completion of the exercise program.
- At the 6-month follow-up, significant improvements in ambulation, physical activity level (~105 min/week), whole body lean mass, and quality of life remained.
Summary of the Evidence to Support Exercise:

There is support in the literature for exercise intervention related to supporting wellness during and following cancer treatment.
Make sure your patients think about exercise!