Obesity, Exercise, and Quality of Life in Endometrial Cancer Survivors

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Today’s Talk

- Health issues and exercise
- Adherence to exercise recommendations
- Motivating survivors to exercise
## Risk Factors for Endometrial Cancer

(AICR/WCRF CUP, 2013)

### Food, Nutrition, Physical Activity and Endometrial Cancer 2013

<table>
<thead>
<tr>
<th></th>
<th>Decreases Risk</th>
<th>Increases Risk</th>
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<tbody>
<tr>
<td>Convincing</td>
<td></td>
<td>Body fatness¹</td>
</tr>
<tr>
<td>Probable</td>
<td>Physical activity²</td>
<td>Glycemic load</td>
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<td></td>
<td>Coffee³</td>
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- Being at a healthy weight and being physically active can prevent roughly 3 in 5 endometrial cancers
- 50% increased risk per 5 BMI units
- PA includes recreational, occupational, and transportation activity
- Sitting behavior emerging as a risk factor
Physical Activity: Gynecologic Cancer Survivors

- Endometrial, MDA
- Endometrial, Canada
- Ovarian, Canada
- Gyn, NHIS

Meeting/exceeding guidelines

Basen-Engquist et al, AJOG, 2008
Stevinson et al, Intl J Gyn Onc, 2009
Courneya et al, Gyn Onc, 2005
Bellizi et al, JCO, 2005
Endometrial Cancer Survivors’ Physical Functioning Varies by Their Activity Level
(Basen-Engquist et al, AJOG, 2008)

Differences by PA level: Unadjusted – Physical functioning, p<.0001, Adjusted – Physical functioning, p<.0001
Endometrial Cancer Survivors’ Fatigue and Pain Varies by Their Activity Level

(Basen-Engquist et al, AJOG, 2008)

Differences by PA level: Unadjusted - Fatigue, p=.018, Pain, p=.021
Adjusted – Fatigue, p=.069; Pain, p=.107
### Effects on Fitness and Body Composition
(Speck et al, J Ca Surv, 2009)

#### Fitness

<table>
<thead>
<tr>
<th></th>
<th>During Trtmnt</th>
<th>After Trtmnt</th>
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<tbody>
<tr>
<td>Physical activity level</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Aerobic fitness</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Upper body strength</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Lower body strength</td>
<td>++</td>
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</table>

+ = significant positive effects; 
0 = no significant effect

#### Body Composition

<table>
<thead>
<tr>
<th></th>
<th>During Trtmnt</th>
<th>After Trtmnt</th>
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<tbody>
<tr>
<td>Body weight</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Fat mass</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lean mass</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Body fat %</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>BMI</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Waist circumference</td>
<td>I</td>
<td>0</td>
</tr>
<tr>
<td>Arm volume</td>
<td>I</td>
<td>I</td>
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</table>

I = insufficient evidence
Effects on Quality of Life and Psychosocial Variables

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<tr>
<th></th>
<th>During Trtmnt</th>
<th>After Trtmnt</th>
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<tbody>
<tr>
<td>Overall QOL</td>
<td>O</td>
<td>+</td>
</tr>
<tr>
<td>Functional QOL</td>
<td>+</td>
<td>O</td>
</tr>
<tr>
<td>Breast-cancer specific QOL</td>
<td>I</td>
<td>+</td>
</tr>
<tr>
<td>Fatigue</td>
<td>O</td>
<td>+</td>
</tr>
<tr>
<td>Confusion</td>
<td>I</td>
<td>+</td>
</tr>
<tr>
<td>Body image</td>
<td>I</td>
<td>+</td>
</tr>
<tr>
<td>Anxiety</td>
<td>+</td>
<td>O</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>+</td>
<td>I</td>
</tr>
</tbody>
</table>

- Insufficient evidence/no significant effect
  - Mental, physical, social, general QOL
  - life satisfaction
  - sexual attractiveness
  - weight concerns
  - physical condition
  - positive mood
  - mood disturbance
  - anger
  - vigor/vitality

- No significant effect, both groups
  - depression
Exercise Guidelines, ACSM & ACS

- AVOID INACTIVITY
- Follow age appropriate guidelines for general population
  - Aerobic: 150 minutes/week moderate or greater intensity
  - Strength: 2x weekly, each major muscle group, 8-10 repetitions, 1-3 sets per exercise
  - Flexibility: at least 2 days per week for 10 min/day (older adults)
- Special precautions: metastases, cardiac findings, lymphedema, stem cell transplant
Adherence to Exercise

I usually do two hours of cardio and then four more of cardio and then two more of cardio...

"I usually do two hours of cardio and then four more of cardio and then two more of cardio.”
Social Cognitive Theory and Physical Activity after Endometrial Cancer (R01 CA109919)

Karen Basen-Engquist, PhD, MPH - Principal Investigator
Cindy Carmack, PhD - Co-Principal Investigator
Population

- Stage I, II, or IIIa endometrial cancer diagnosed in past 5 years
- Completed treatment at least 6 months ago
- Not currently meeting public health guidelines for physical activity
- Obtain physician clearance for exercise; no contraindications for cardiorespiratory fitness testing
Design: Assessment and Intervention Schedule

**T0: Baseline**
- Home-based Assessment
- Lab Exercise and assessment
- Exercise prescription
- Home-based Assessment

**Weekly Telephone Counseling for Exercise Adherence**

**T1: 2 months**
- Home-based Assessment
- Lab Exercise and assessment
- Home-based Assessment

**Semi-Weekly Telephone Counseling for Exercise Adherence**

**T2: 4 months**
- Home-based Assessment
- Lab Exercise and assessment
- Home-based Assessment

**Monthly Telephone Counseling for Exercise Adherence**

**T3: 6 months**
- Home-based Assessment
- Lab Exercise and assessment
- Home-based Assessment
Intervention Components

- **Exercise Recommendation**
  - Main modality moderate intensity walks
  - Goal – 30 minutes of accumulated activity on most days of the week
- **Telephone Counseling**
  - Weekly in months 1 & 2, every two weeks on months 3 & 4, monthly in months 5 & 6
  - 15-20 minute session
  - Provide individualized feedback, problem solving, and motivational factors
- **Print Materials**
  - Self-regulatory skills using cognitive-behavioral techniques
  - Role model stories
- **Pedometers**
Sample Demographics, n=100

**Race/ethnicity**
- 75% White, non-Hispanic
- 12% White, Hispanic
- 7% Black, non-Hispanic
- 6% Other

**Education**
- 2% < high school
- 13% HS diploma/GED
- 8% Technical/vocational degree
- 36% Some college/2 yr degree
- 24% 4 year degree
- 17% Advanced degree

**Age, M=57.1 (11.1), range=25-78**
- 8%, <40
- 12%, 40 – 49
- 34%, 50 – 59
- 35%, 60 – 69
- 11%, 70+
Medical Issues

Disease/treatment
- On average, 26.1 (14.4) months from diagnosis
- 59% had surgery only; 40% had surgery and radiation; 1% had radiation only
- Stage I, 80%; Stage II, 16%; 4%, Stage III
- 15% had another cancer diagnosis

BMI, M=34.3 (9.4), range=19-69.3
- 15%, <25
- 21%, 25 – 29.9
- 25%, 30 – 34.9
- 11%, 35 – 39.9
- 28%, 40+

Number of co-morbidities, M=3.2, SD=2.0, range=0-11
- 53%, Hypertension
- 41%, Anemia
- 37%, Peripheral neuropathy
- 31%, Thyroid problems
- 27%, Osteoarthritis
- 18%, Lung problems
- 21%, Diabetes
- 13%, mental health diagnosis
- 10%, heart condition (angina or arrhythmia)
Minutes of Exercise
Steps to Health
(Basen-Engquist et al, 2014)

Adjusted Mean Minutes of Exercise/Day

Adjusted Mean Minutes of Exercise/Day

Baseline Pre Lab  Baseline Post Lab  Month 2  Month 4  Month 8
Assessment Time

Obese  Non-obese
Changes in Quality of Life
Steps to Health
(Basen-Engquist et al, 2014)

Physical Functioning
Time, $p<.001$
Obesity, $p<.001$

General Health
Time, $p<.001$
Obesity, $p=.001$
Changes in Quality of Life
Steps to Health
(Basen-Engquist et al, 2014)

Vitality
Time, $p<.001$

Mental Health
Time, $p<.029$
Changes in Quality of Life
Steps to Health
(Basen-Engquist et al, 2014)

Distress - Recurrence
Time, $p=0.032$
Obesity, $p=0.01$

Negative Affect
Time, $p<0.001$
Changes in Quality of Life
Steps to Health

Cognitive Problems
Time, p=.005

Stress
Time, p<.001
Does obesity make a difference in exercise program outcomes?

No significant Time by Obesity status interactions

Similar improvements in both obese and non-obese endometrial cancer survivors
Model of Social Cognitive Theory
Adoption of Exercise Behavior

- Comorbidities And obesity
- Cardiorespiratory Fitness
- Exercise History
- Somatic Sensations/Affect
- Mastery Experiences
- Exercise Modeling
- Social support for activity
- Self-efficacy
- Exercise Adherence
- Outcome Expectations
- Short term outcomes
- Long-term Outcomes

Adherence for activity

Outcome Expectations

Short term outcomes

Long-term Outcomes
Assessment Methodology

Retrospective questionnaires
- Anthropometrics
- Cardiorespiratory fitness test
- Implicit tasks

- Home-based Assessment 5 days
- Laboratory Assessment
- Home-based Assessment 5 days

Ecological Momentary Assessment
- Scheduled AM assessment: Self-efficacy & outcome expectations
- Random assessments: somatic sensations
- User initiated: Exercise minutes and intensity
- Scheduled PM assessment: Exercise
  - Accelerometers
  - Worn daily during waking hours on EMA assessment days
A 1-point increase in positive outcome expectations was associated with an increase of 3.9 minutes of exercise (t=3.62, p=0.0003)

Negative outcome expectations not associated with exercise minutes (t=-1.01, p=0.31)

A 1-point increase in self-efficacy was associated with an increase of 6 minutes of exercise (t=14.7, p<0.0001)

Basen-Engquist et al, Health Psychology, 2013
Self-efficacy Association with Exercise Minutes

- With self-efficacy and outcome expectations in the same model, self-efficacy remains significant (estimate = 6.09, SEE=0.43, t=14.26; p<0.0001), but positive outcome expectations is not.
- Self-efficacy remains significant when:
  - Accelerometer minutes are used as DV
  - Exercise is dichomized
  - Only those with >0 minutes of exercise included
  - SE from day before is included in model
Longitudinal Prediction of Exercise Minutes

- Do SCT variables measured at earlier time points predict exercise minutes at subsequent time points?
- Lab measures of exercise self-efficacy, barriers self-efficacy, positive & negative outcome expectations
- Only exercise self-efficacy predicted minutes of exercise at the next time point (controlling for baseline exercise minutes \( p=0.0021 \))
Model of Social Cognitive Theory
Adoption of Exercise Behavior

- Comorbidities
- And obesity
- Cardiorespiratory Fitness
- Exercise History
- Somatic Sensations/Affect
- Mastery Experiences
- Exercise Modeling
- Social support for activity
- Self-efficacy
- Exercise Adherence
- Short term outcomes
- Long-term Outcomes
- Outcome Expectations
Self-efficacy before an after exercise test: survivors and controls

- **Effect of exercise test on SE**
  - Survivors: significant increase
  - Controls: no change

- **Predictors of post-exercise SE**
  - Survivors: Pre-exercise SE, pre-exercise somatic sensations, post-exercise somatic sensations (inverse)
  - Controls: pre-exercise SE, post-exercise somatic sensations, estimated VO2 max

- **Change in self-efficacy positively associated with number of minutes of exercise in following week**

Hughes et al, JPAH, 2010
Conclusions and Implications

- Exercise is beneficial to endometrial cancer survivors
- Obese survivors realize similar benefits from exercise as non-obese survivors, even if they are not exercising as much
- Self-efficacy – confidence in their ability to exercise is key to exercise adherence
  - Varies day-to-day and affects whether exercise is done, and how long survivor exercises
- Indicates that a real-time intervention – “ecological momentary intervention” - may be useful in increasing exercise behavior in this population
- Preliminary data indicates that how people feel during exercise, physically and emotionally
- Providers can provide support and recommendations, normalize feelings experienced during exercise
Thank you

Should I Workout Today?

Yes

Go workout

No

Yes you should.