Promoting Behavior Change After Cancer: Physical Activity

Kerry S. Courneya, PhD
Professor and CIHR Investigator
University of Alberta
Edmonton, AB, Canada
Progression of Behavioral Research

• does the behavior have important outcomes?

• what is the prevalence of the behavior?

• what are the predictors of the behavior?

• how can the behavior be changed?
Outcomes of Physical Activity in Cancer Survivors

- > 70 studies on exercise in cancer survivors.
- Half have examined breast cancer survivors.
- Most tested ACSM vigorous exercise.
- Almost all show positive benefits to QOL.
- Safety, feasibility, and efficacy (improved fitness, fatigue, mood, overall QOL).
Prevalence of Physical Activity in Cancer Survivors

- there are really no guidelines for cancer survivors and they will likely vary depending on many different factors (disease, treatments, etc.).

- how best to measure the effects of cancer (diagnosis and treatments) on PA behavior?
  - compare current PA of survivors with matched group.
  - ask cancer survivors to report PA during different cancer-related time periods and calculate change.
  - ask directly about change.
Prevalence of Physical Activity in Cancer Survivors

- U.S. national health interview survey (NHIS).
- 335 breast cancer cases and 16,880 controls.
- 66 years; 40% at least high school.
- 10 years postdiagnosis.
- asked for current PA levels.

(Blanchard et al. Behavioral Medicine 2003;28:140-49)
Percentage Meeting ACSM/CDC Guidelines (>150 or 60 minutes/week)

(Blanchard et al. *Behavioral Medicine* 2003;28:140-49)
Prevalence of Physical Activity in Cancer Survivors

- population-based survey in Alberta.
- 438/830 (53%) NHL cancer survivors.
- 61 years (SD=13); 52% male; 29% university degree; 34% employed.
- 62 months (SD=25) since diagnosis; 80% chemotherapy.
- ask to recall exercise at three time points.

(Vallance et al. submitted)
Weekly Exercise Minutes Across the Cancer Experience (438 NHL survivors)

(Valance et al. submitted)
Percentage Meeting ACSM/CDC Guidelines (>150 minutes/week)

Prediagnosis | On Treatment | Off Treatment

(Valance et al. submitted)
Prevalence of Physical Activity in Cancer Survivors

- convenience sample at 4 outpatient clinics in U.S.

- 352/572 (62%) mixed cancer survivors.

- 60 years; 71% female; 88% at least high school.

- 49% breast; 44% within 1 year diagnosis.

- asked if exercise had changed since diagnosis.

(Blanchard et al. *Am. J. Health Beh.* 2003;27:246-56)
Change in Exercise Levels Since Cancer Diagnosis by Current Exercise

(Blanchard et al. *Am. J. Health Beh.* 2003;27:246-56)
Limitations of Prevalence Studies

- early studies used many different cut-points.
  - most now use ACSM/CDC guidelines.
  - what are the guidelines for cancer survivors?

- few comparisons to general population.
  - are these really needed?
  - is change since diagnosis a better indicator?
  - no change studies have used a prospective design.

- estimates of PA are on the high side.
  - self-reports lead to over estimates (fitness testing).
  - selection bias from transparent studies (mask study).
Predictors of Physical Activity in Cancer Survivors

- Some descriptive studies examining medical and demographic factors.
- Most theoretical studies have examined the theory of planned behavior.
- Some studies have examined other social cognitive models.
Predictors of Physical Activity in Cancer Survivors

- 812 breast cancer survivors (HEAL study).
- Within 1 year of diagnosis.
- 55 years (SD=6); 95% white; 96% completed HS.
- 82% in situ/stage I; 30% chemotherapy.
- Ask to recall exercise 1 year before diagnosis and in the past month.

(Irwin et al. Cancer 2003;97:1746-57)
Predictors of Physical Activity in Cancer Survivors

- Overall decrease in total PA of 2 hrs/week (11%).

- Decrease in sports PA in women treated with RT/CT (50%) than surgery alone (24%) or RT alone (23%).

- Decrease in sports PA in obese women (41%) than normal weight women (24%).

(Irwin et al. Cancer 2003;97:1746-57)
Theory of Planned Behavior (Ajzen, 1991)

- External Variables
  - Demographics
  - Personality
  - Environment
  - Medical

- Behavioral Beliefs
- Normative Beliefs
- Control Beliefs
- Attitude
- Subjective Norm
- Perceived Behavioral Control
- Intention
- Behavior
### Predictors of Physical Activity in Cancer Survivors

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>INT</th>
<th>PBC</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courneya et al. (1997)</td>
<td>110 CRC</td>
<td>.29*</td>
<td>.28*</td>
<td>.22*</td>
</tr>
<tr>
<td>Courneya et al. (1999)</td>
<td>164 BC</td>
<td>.26*</td>
<td>.22*</td>
<td>.14*</td>
</tr>
<tr>
<td>Courneya et al. (1999)</td>
<td>66 CRC</td>
<td>.45*</td>
<td>.21*</td>
<td>.30*</td>
</tr>
<tr>
<td>Courneya et al. (2000)</td>
<td>37 BMT</td>
<td>.32*</td>
<td>.33*</td>
<td>.36*</td>
</tr>
<tr>
<td>Courneya et al. (2001)</td>
<td>24 BC</td>
<td>.64*</td>
<td>.10</td>
<td>.35*</td>
</tr>
<tr>
<td>Blanchard et al. (2002)</td>
<td>83 BC</td>
<td>.47*</td>
<td>.15</td>
<td>.32*</td>
</tr>
<tr>
<td></td>
<td>46 PC</td>
<td>.50*</td>
<td>.15</td>
<td>.37*</td>
</tr>
<tr>
<td>Rhodes et al. (2003)</td>
<td>272 MC</td>
<td>.49*</td>
<td>.15*</td>
<td>.34*</td>
</tr>
</tbody>
</table>
# Predictors of PA Intentions in Cancer Survivors

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>ATT</th>
<th>PBC</th>
<th>SN</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courneya et al. (1997)</td>
<td>110 CRC</td>
<td>.45*</td>
<td>.00</td>
<td>.15</td>
<td>.31*</td>
</tr>
<tr>
<td>Courneya et al. (1999)</td>
<td>164 BC</td>
<td>.29*</td>
<td>.04</td>
<td>.30*</td>
<td>.23*</td>
</tr>
<tr>
<td>Courneya et al. (1999)</td>
<td>66 CRC</td>
<td>.43*</td>
<td>ns</td>
<td>ns</td>
<td>.23*</td>
</tr>
<tr>
<td>Courneya et al. (2000)</td>
<td>37 BMT</td>
<td>.49*</td>
<td>.42*</td>
<td>.05</td>
<td>.68*</td>
</tr>
<tr>
<td>Courneya et al. (2001)</td>
<td>24 BC</td>
<td>.32</td>
<td>.33*</td>
<td>.58*</td>
<td>.49*</td>
</tr>
<tr>
<td>Blanchard et al. (2002)</td>
<td>83 BC</td>
<td>.27*</td>
<td>.36*</td>
<td>.20*</td>
<td>.45*</td>
</tr>
<tr>
<td></td>
<td>46 PC</td>
<td>.05</td>
<td>.59*</td>
<td>.08</td>
<td>.36*</td>
</tr>
<tr>
<td>Rhodes et al. (2003)</td>
<td>272 MC</td>
<td>.25*</td>
<td>.48*</td>
<td>.13*</td>
<td>.46*</td>
</tr>
</tbody>
</table>
Limitations of Predictor Studies

- very few studies have been conducted.
- perhaps premature except for breast cancer.
- most have been on the TPB.
- environmental factors have been neglected.
- relatively small samples.
- mostly self-reports of exercise.
Interventions to Promote Physical Activity in Cancer Survivors

- **Outcomes Studies (PA as independent variable)**
  - primary interest is the outcomes of PA.
  - PA is a means to an end (manipulation check).
  - behavioral support may be provided.
  - control group is asked not to change PA.

- **Behavior Change (PA as dependent variable)**
  - primary interest is change in PA.
  - control group is not asked anything or is given advice to exercise with no intervention.
**Oncologist Recommendation to Exercise (ONCORE) Trial**

- RCT comparing two oncologist exercise recommendations to usual care in 329 newly diagnosed BC survivors.
- Recommendation during primary treatment consultation.
- Primary outcome was self-reported exercise at 5 weeks completed by telephone.

(Jones et al. *ABM* in press)
MET-hrs/week

RO-UC = 3.4
CI = 0.7 to 6.1
p = .011

RR-UC = 1.5
CI = -1.0 to 4.0
p = .244

(Jones et al. ABM in press)
ACSM/CDC (% ≥150mins/week)

RO-UC= 10.7
CI=0.8 to 20.3
p=.029

RR-UC= 5.2
CI=-4.0 to 13.9
p=.303

(Jones et al. *ABM* in press)
Limitations of Intervention Studies

- very limited research at this time.
- perhaps premature except for breast cancer.
- lots of good research from elsewhere that can be applied to cancer survivors.
- need to focus on issues unique to cancer survivors (e.g., motives, barriers, oncologists, cancer agencies, cancer centers).
Summary

- good evidence that PA enhances QOL in breast cancer survivors, especially posttreatment.
- PA will probably enhance QOL for most cancer survivor groups post/off treatment.
- PA may enhance QOL for most cancer survivors during treatments.
- unknown if PA will reduce the risk of recurrence and extend survival in cancer survivors.
PA is low in cancer survivors but it is unknown if it is lower than other groups. PA decreases from prediagnosis levels and is lower during on versus off treatment periods. PA is predicted by social cognitive beliefs and some medical and demographic variables. Oncologists may play a small but important role in promoting PA to cancer survivors.
Acknowledgements

Thanks to the many colleagues, students, and research participants who have contributed to this research.

K.S. Courneya is supported by an Investigator Award from the Canadian Institutes of Health Research and a Research Team Grant from the National Cancer Institute of Canada.