

# **Physical Activity Interventions in Cancer Survivors: What works?**

**Kerry S. Courneya, PhD**  
**Professor and Canada Research Chair**  
**in Physical Activity and Cancer**  
**Behavioral Medicine Laboratory**  
**Faculty of Physical Education and Recreation**  
**University of Alberta, Edmonton, Canada**

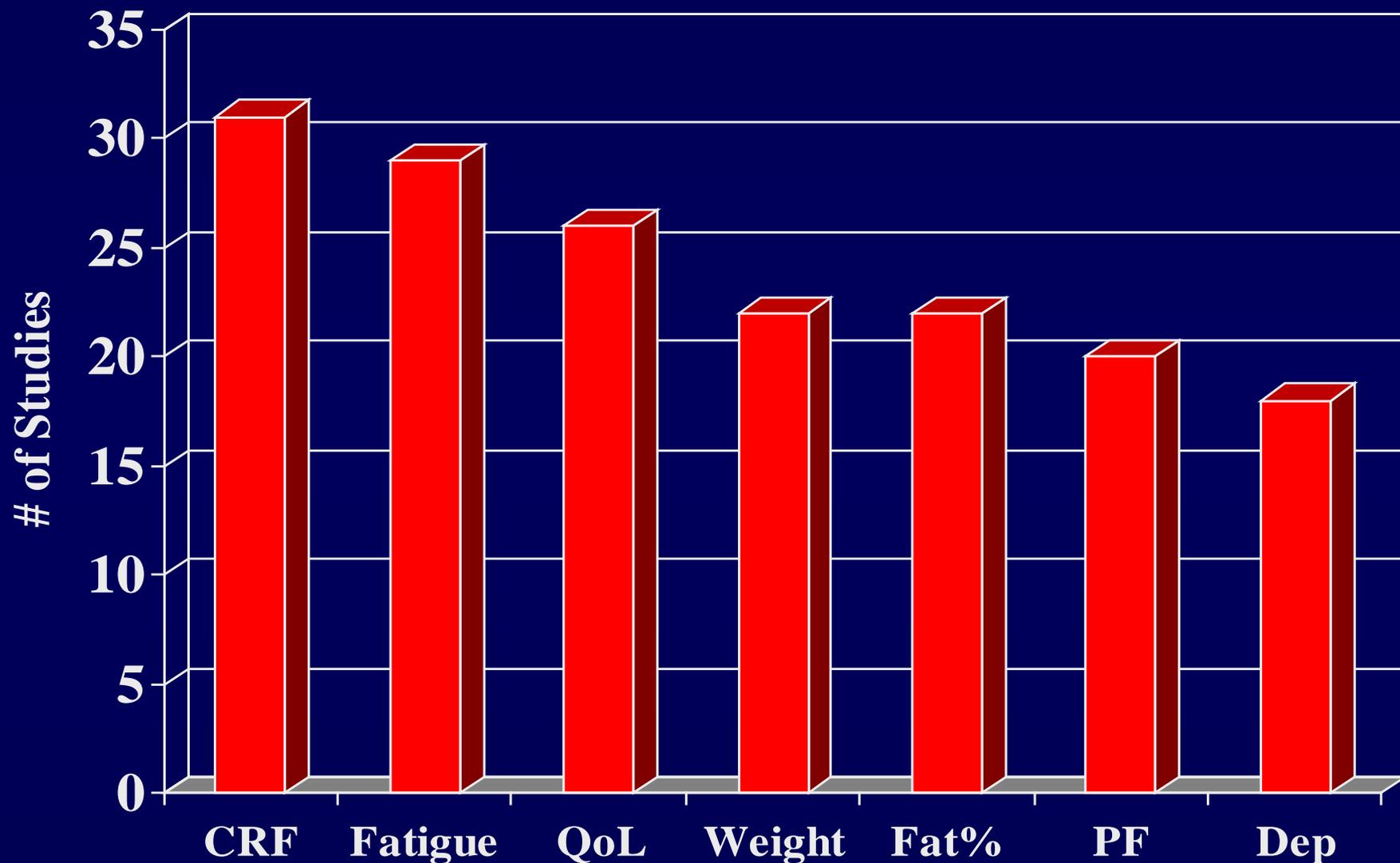
# Systematic Reviews

- ① dozens of reviews in past 10 years.
- ① early reviews included “everything”.
- ① more recent reviews have become more targeted:
  - ① cancers (e.g., breast, prostate, hematologic, lung)
  - ① phases (e.g., treatment, survivorship, end-of-life)
  - ① outcomes (e.g., fatigue, depression, QoL, survival)
  - ① exercise interventions (e.g., resistance, Yoga)
- ① and have included meta-analysis and RCTs only.

# Systematic Review of all Outcomes

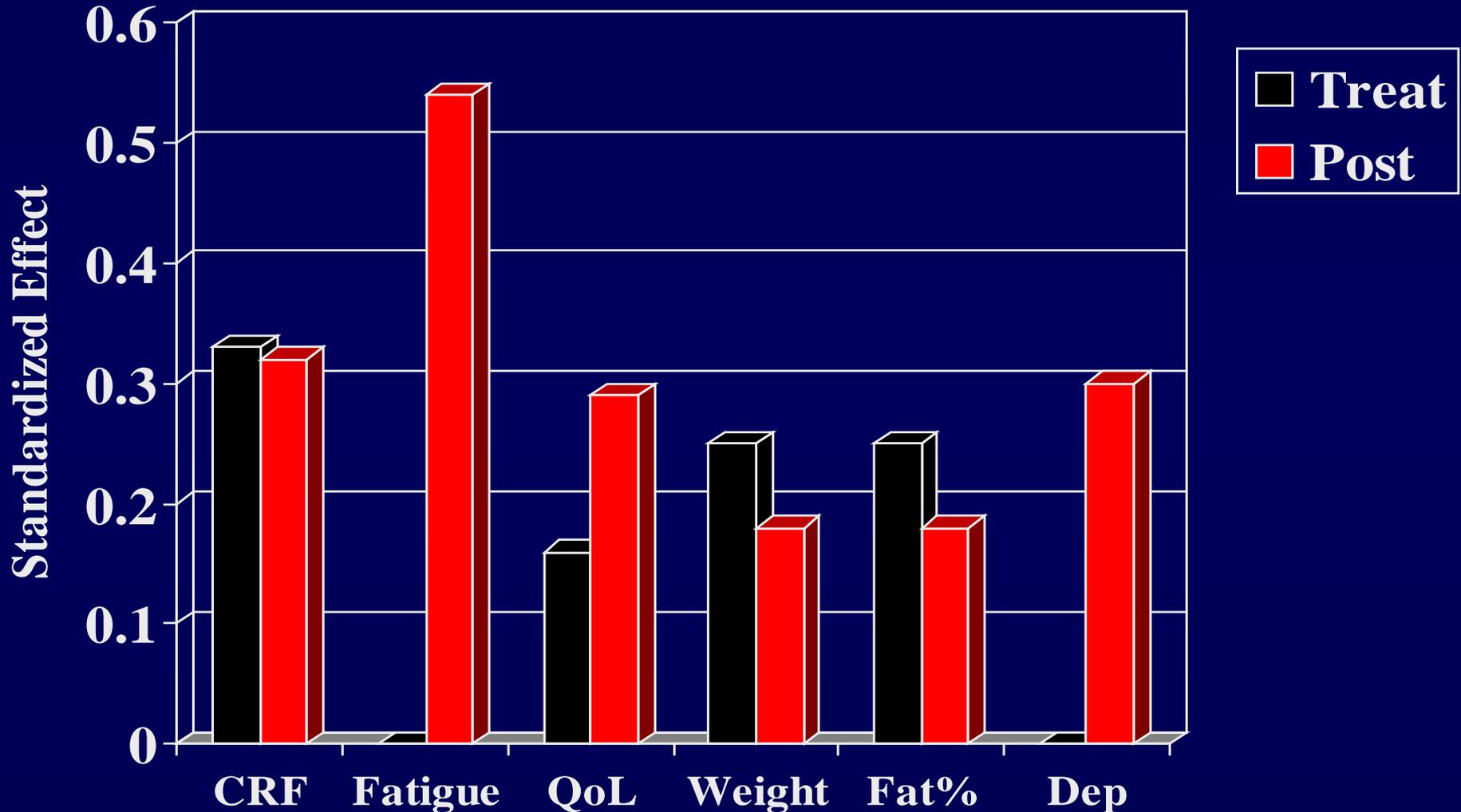
- ⑧ 82 studies involving 6,838 cancer survivors.
- ⑧ 74 (90%) RCTs; 66 (80%) high quality.
- ⑧ 60 different outcomes reported.
- ⑧ 40% active treatment/60% survivorship.
- ⑧ 83% included breast cancer survivors.
- ⑧ mean n = 41 per group.

# Most Common Outcomes in PA Studies



(Speck et al. *J Cancer Surviv* 2010;4;87-100)

# Meta-Analysis of Common Outcomes

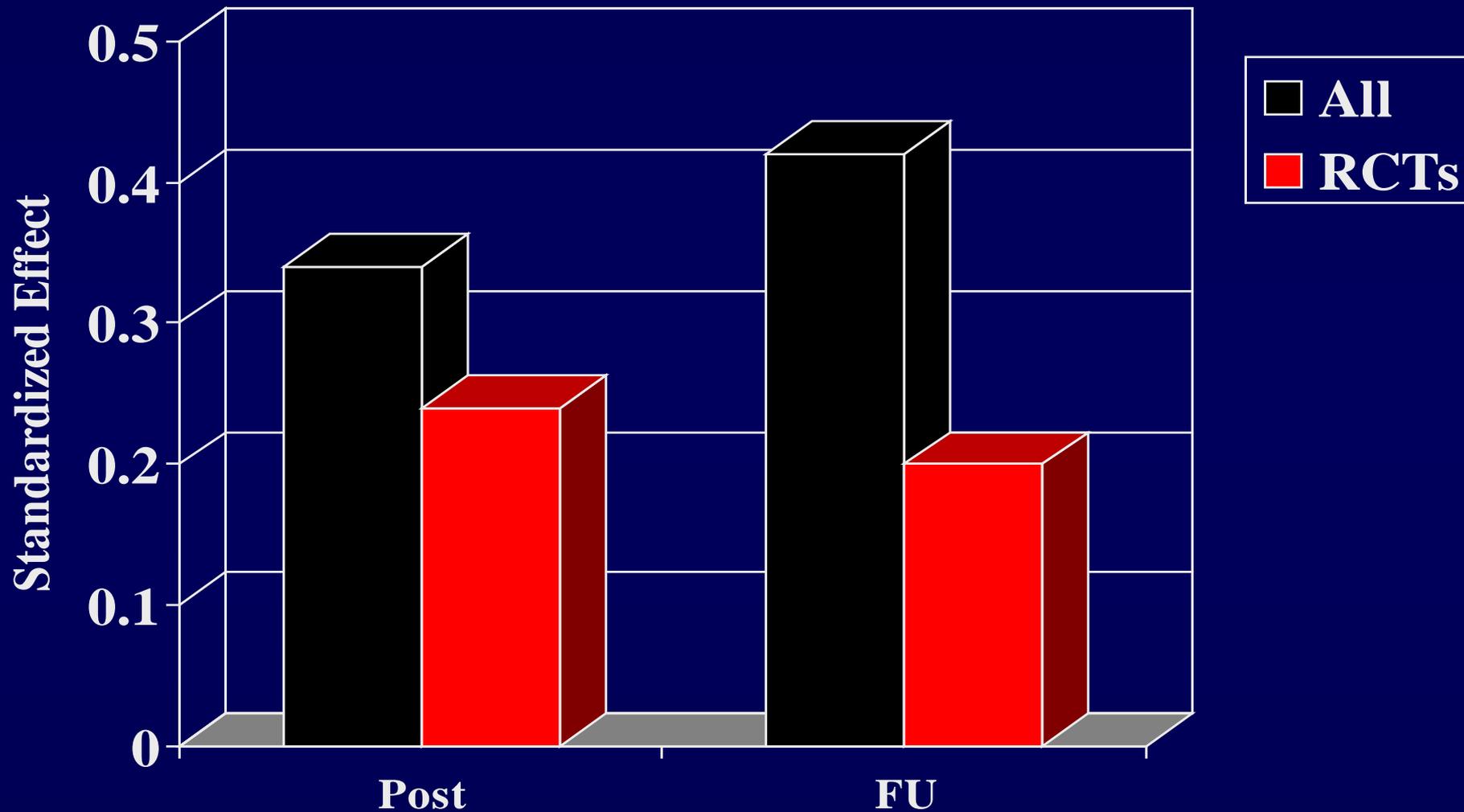


(Speck et al. *J Cancer Surviv* 2010;4;87-100)

# Systematic Review on QoL

- ① QoL (FACT, EORTC, SF36).
- ① included RCTs and uncontrolled trials.
- ① 78 studies involving 3,629 cancer survivors.
- ① 13±11 weeks; 51±30 mins; 4.2±2.2 METs.
- ① 56% supervised exercise interventions.
- ① 54% breast; 32% mixed cancer survivors.

# Meta-Analysis of QoL Results



(Ferrer et al. *Ann Beh Med* 2011;41:32-47)

# Moderators of QoL Results

Intervention efficacy increased with:

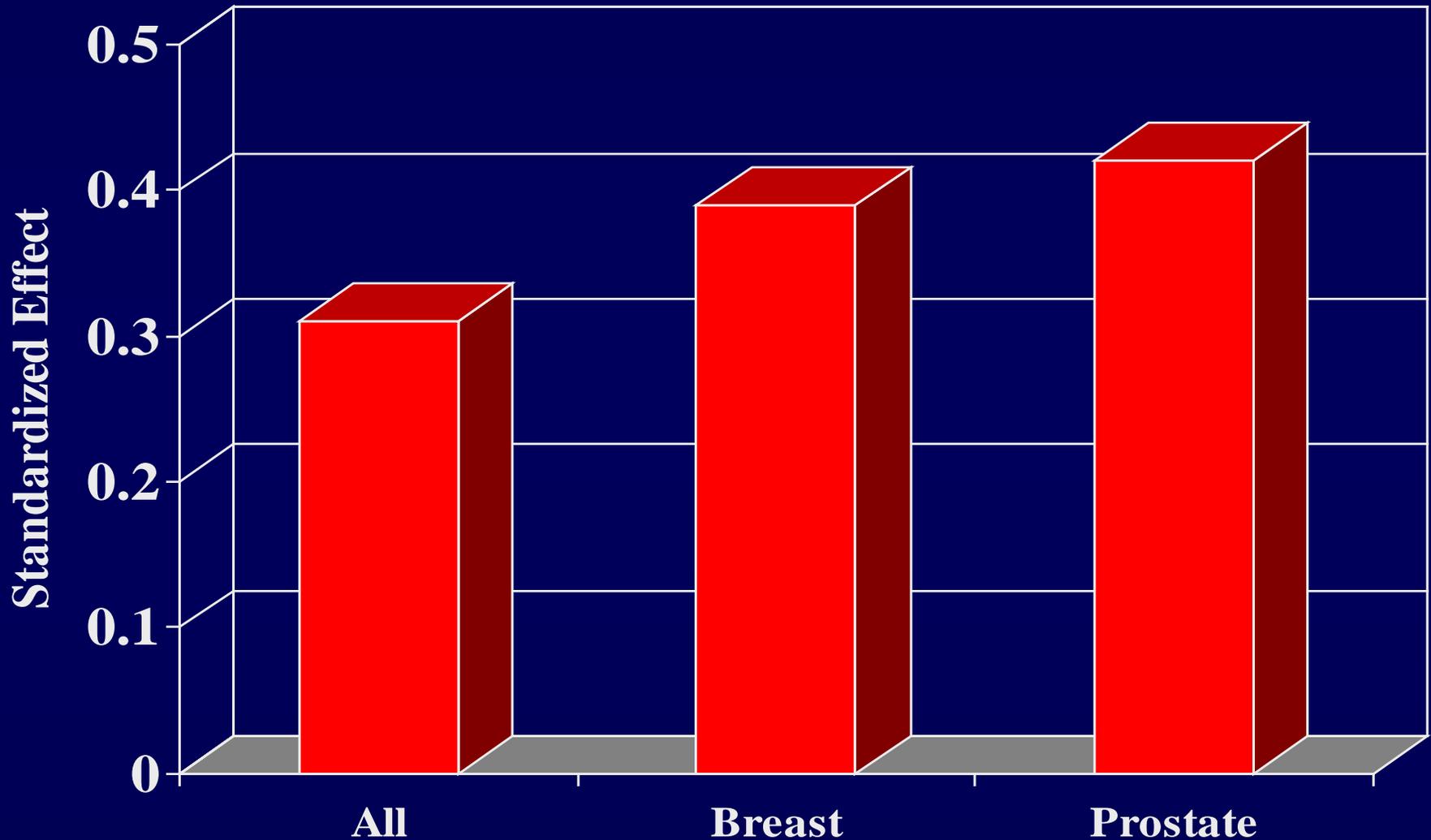
- Ⓜ smaller sample sizes,
- Ⓜ shorter length interventions,
- Ⓜ supervised exercise,
- Ⓜ moderate (5-6 METs) vs. light (<4 METs),
- Ⓜ breast cancer/female survivors.

**\*No medical variables examined.**

# Systematic Review on Fatigue

- ① fatigue (FACT-F, Piper, POMS, EORTC).
- ① 44 RCTs involving 3,254 cancer survivors.
- ① 46% of RCTs on treatment.
- ① 12±5 weeks; 49±23 mins; 5.6±3.0 METs.
- ① 24 AET; 6 RET; 11 comb; 6 tai-chi/yoga.
- ① 86% female cancer survivors.

# Meta-Analysis of Fatigue Results



(Brown et al. *Can. Epi. Bio. Prev.* 2011;20;123-33)

# Moderators of Fatigue Results

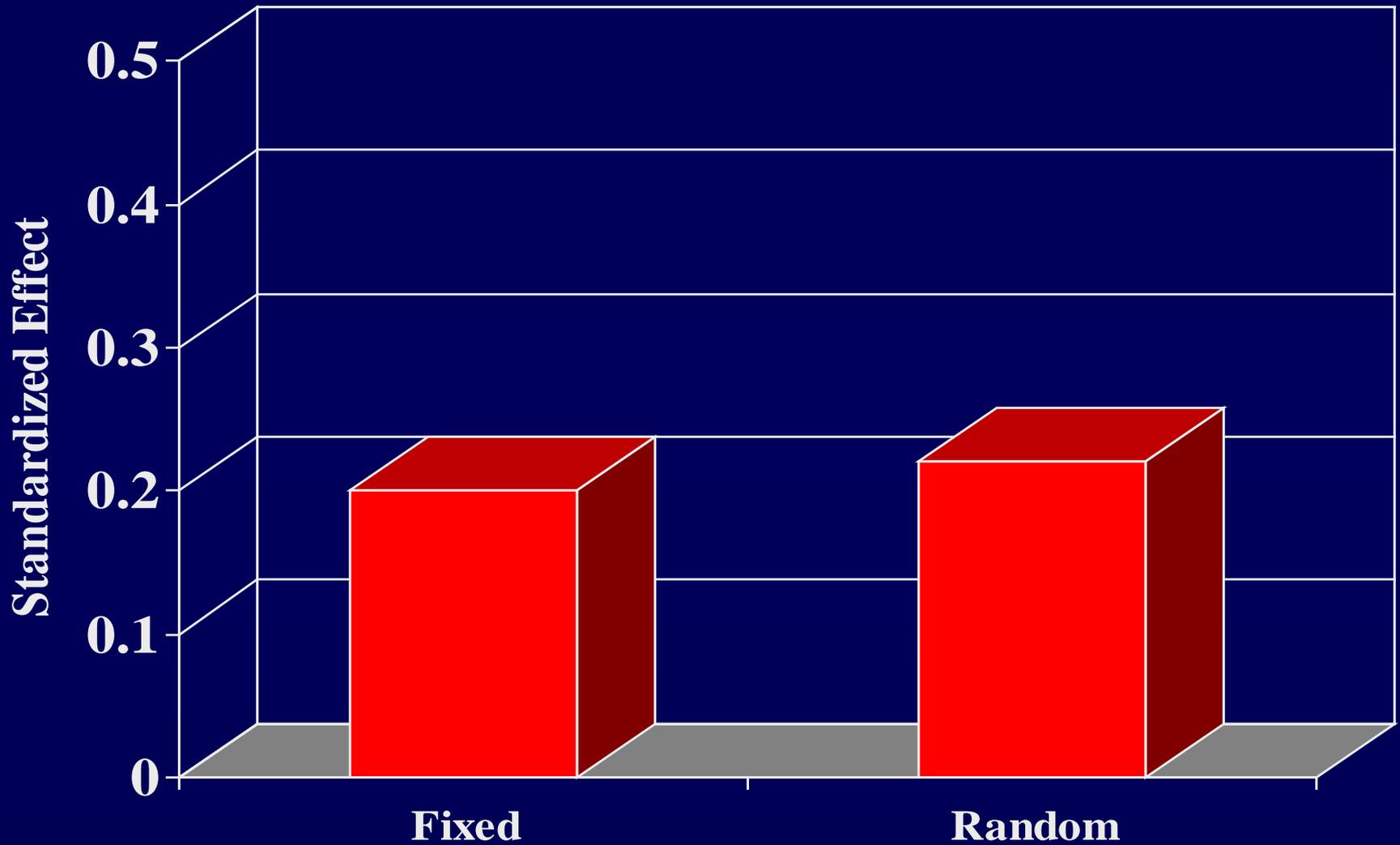
**Intervention efficacy increased with:**

- ① **intensity of resistance exercise,**
- ① **theoretically-driven interventions,**
- ① **older cancer survivors.**

# Systematic Review on Depression

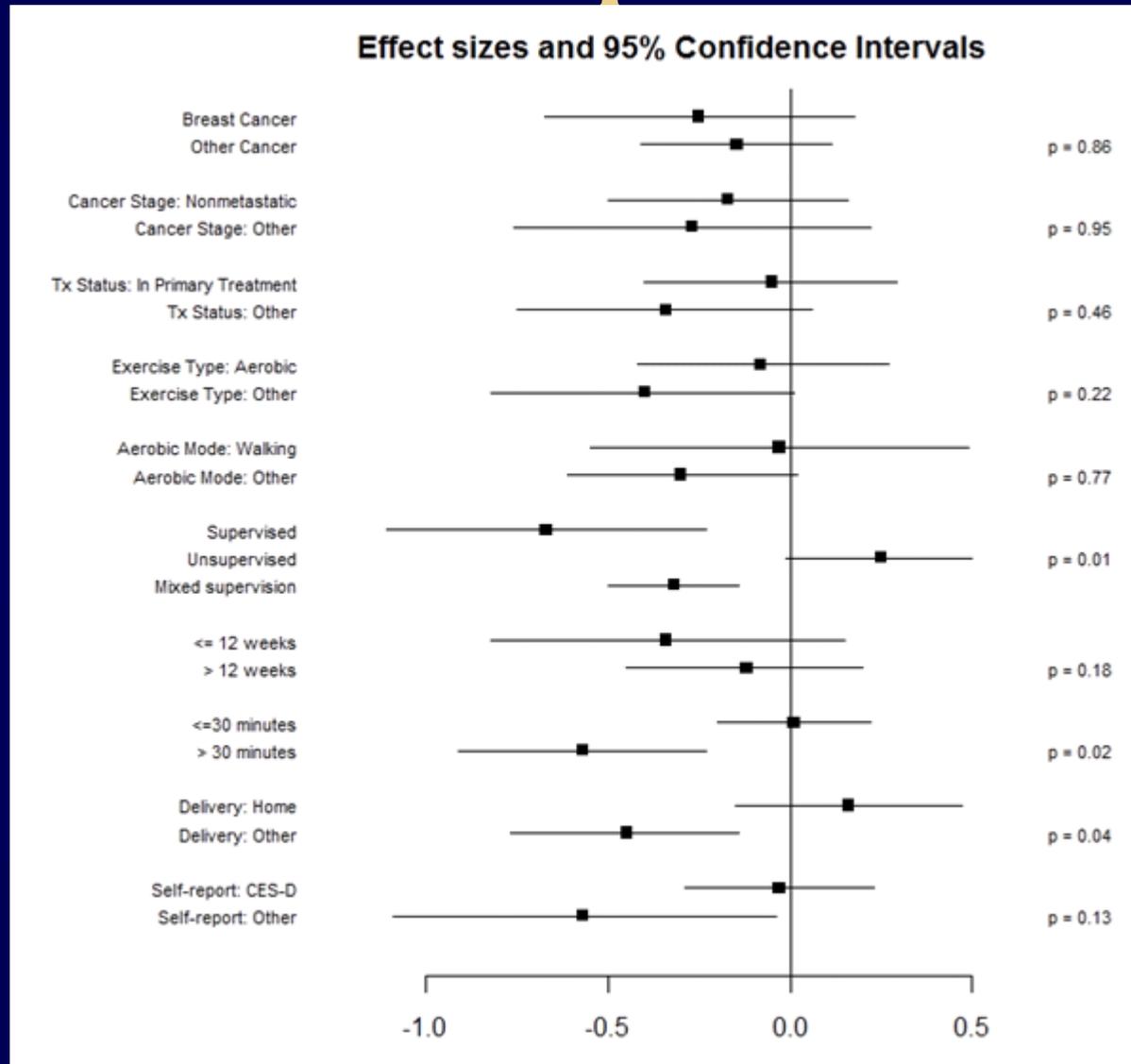
- ① depression (e.g., CES-D, BDI, HADS).
- ① included RCTs only.
- ① 15 RCTs involving 1,371 cancer survivors.
- ① 60% breast cancer survivors.
- ① 47% during treatment.

# Meta-Analysis of Depression Results



(Craft et al. *CEBP* in press)

# Moderators of Depression Results



(Craft et al. *CEBP* in press)

# Summary of Meta-Analyses

- ① **EX is effective for improving health-related fitness (CRF, strength, body composition, PF).**
- ① **EX effective for improving some patient-reported outcomes (e.g., QoL, fatigue, psychosocial).**
- ① **most effects are small-to-moderate.**
- ① **some effects are larger and more consistent during survivorship than adjuvant treatment phase.**

# Summary of Meta-Analyses

- ① effects are larger for supervised exercise, facility-based exercise, moderate vs. light intensity,  $\geq 30$  minutes/session, and breast/female survivors.
- ① resistance exercise appears particularly helpful, especially for older (prostate?) cancer survivors.
- ① EX is safe and feasible and does not interfere with Tx completion/response or cause adverse events.

# Limitations of Exercise Research

- Ⓜ most outcomes in MAs are secondary outcomes.
- Ⓜ participants are not selected based on outcome (e.g., depressed, fatigued, anxious, poor QoL, low PF).
- Ⓜ few RCTs have included comparison groups that control for attention/social interaction (placebo).
- Ⓜ few RCTs examined mediators and moderators.
- Ⓜ conclusions based on breast cancer studies.
- Ⓜ moderator analyses in MAs are confounded.

# From Research to Practice

- ① most EX trials are supervised/efficacy trials.
- ① unsupervised EX trials yield smaller benefits.
- ① unsupervised interventions have tested tailored or targeted print materials and/or telephone counseling.
- ① difficulty changing PA behavior let alone outcomes.
- ① DPP/Look AHEAD intervention has become a model.

# Key Intervention Components in DPP

- ① face-to face sessions with qualified staff.
- ① incorporate some supervised PA.
- ① set clear and challenging PA goals.
- ① follow behavior modification techniques.
- ① provide intensive and ongoing (tapering) contact.
- ① provide written materials to supplement advice.
- ① individual tailoring of intervention (tool box).
- ① adopt a theoretical model.

# Colon Health and Life-Long Exercise Change (CHALLENGE) Trial

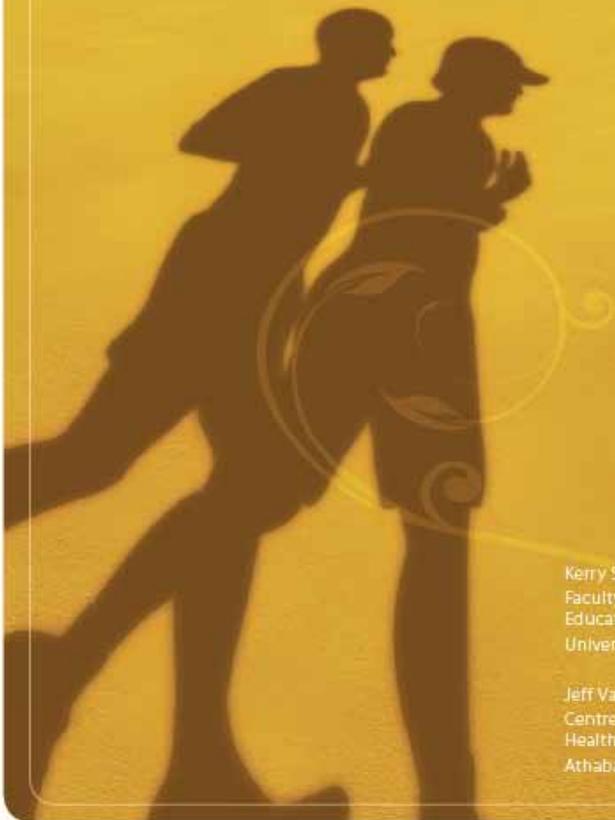
- Ⓡ RCT comparing 3 year PA intervention to HE on disease-free survival in colon cancer survivors 2-6 months after treatment.
- Ⓡ first exercise trial with disease outcome as primary endpoint.
- Ⓡ multinational trial with 962 planned participants.
- Ⓡ trial opened to accrual in May 2009.
- Ⓡ funded by NCIC-CTG and NHMRC in Australia.

# Key Intervention Components in CO.21

- ① based on the Theory of Planned Behavior.
- ① CO.21 exercise guidebook.
- ① supervised exercise sessions.
- ① face-to-face counseling sessions (14 developed).
- ① telephone counseling sessions.
- ① tool box money (\$400).
- ① free/low cost access to a fitness facility.

# step up to the challenge

an exercise guide for colon cancer survivors



Kerry S. Courneya, PhD  
Faculty of Physical  
Education and Recreation  
University of Alberta

Jeff Vallance, PhD  
Centre for Nursing and  
Health Studies  
Athabasca University

## Behavioral Sessions

1. Introduction
2. Introduction
3. Goal Setting/Planning
4. Pedometers
5. Three Month Fitness Test
6. Benefits of Physical Activity
7. Barriers to Physical Activity
8. Environmental Scan
9. Social Support
10. Having Fun with PA
11. Stimulus Control
12. Decision Balance Sheet
13. Self-monitoring
14. Time management

(Vallance et al *J Phys Act Health* 2010;7:794-801)

## THE CHALLENGE TRIAL

TABLE II Physical activity program intervention

| <i>Content</i>                                       | <i>Phase</i>                                                                                                                                                                    |                                                                                                                                  |                                                                                                                                      |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
|                                                      | <i>Baseline to 6 mo.</i>                                                                                                                                                        | <i>6–12 mo.</i>                                                                                                                  | <i>12–36 mo.</i>                                                                                                                     |
| Behaviour support sessions <sup>a</sup>              | 12 Mandatory face-to-face sessions held biweekly                                                                                                                                | 12 Mandatory sessions held biweekly, with option for face-to-face or telephone delivery                                          | Mandatory monthly sessions, with option for face-to-face or telephone delivery                                                       |
| Supervised physical activity sessions <sup>a,b</sup> | 12 Mandatory sessions combined with the mandatory behaviour support sessions<br><br>12 Additional supervised physical activity sessions on alternate weeks strongly recommended | 12 Sessions recommended; can be combined with the biweekly behaviour support sessions for those who choose face-to-face sessions | Monthly sessions recommended; can be combined with the monthly behaviour support sessions for those who choose face-to-face sessions |
| Physical activity goal <sup>c</sup>                  | Gradually increase recreational physical activity by 10 metabolic equivalent task (MET)-hours weekly over baseline (to 10–19 MET-hours weekly)                                  | Individualized (based on phase I results) to a maximum increase of 20 MET-hours weekly (to a total of 20–27 MET-hours weekly)    | Individualized (based on phase II results) to a maximum total of 27 MET-hours weekly                                                 |

# Conclusions

- ④ PA interventions are safe, feasible, and improve many health outcomes in cancer survivors.
- ④ supervised exercise interventions provide optimal benefits but are expensive with low reach.
- ④ unsupervised (mediated) distance-based interventions are inexpensive with high reach but efficacy is questionable.
- ④ DPP may provide a compromise model to follow.

# Acknowledgements

- ① Many colleagues, students, staff and study participants have contributed to this research.
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