Exercise After Prostate Cancer: Active Surveillance and Beyond

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Outline of the Talk

- exercise across the postdiagnosis cancer continuum.
- results from the ERASE Trial.
- results from the PREVENT Trial.
- results from the prostate cancer cohort study.
- exercise guidelines for (prostate?) cancer survivors.

Exercise After a Cancer Diagnosis

- exercise after diagnosis (active surveillance).
- exercise before treatments (prehabilitation).
- exercise during treatments (RT, ADT, chemo).
- exercise after treatments (rehabilitation).
- exercise during survivorship (long term outcomes).
- exercise in advanced/metastatic cancer (palliation).

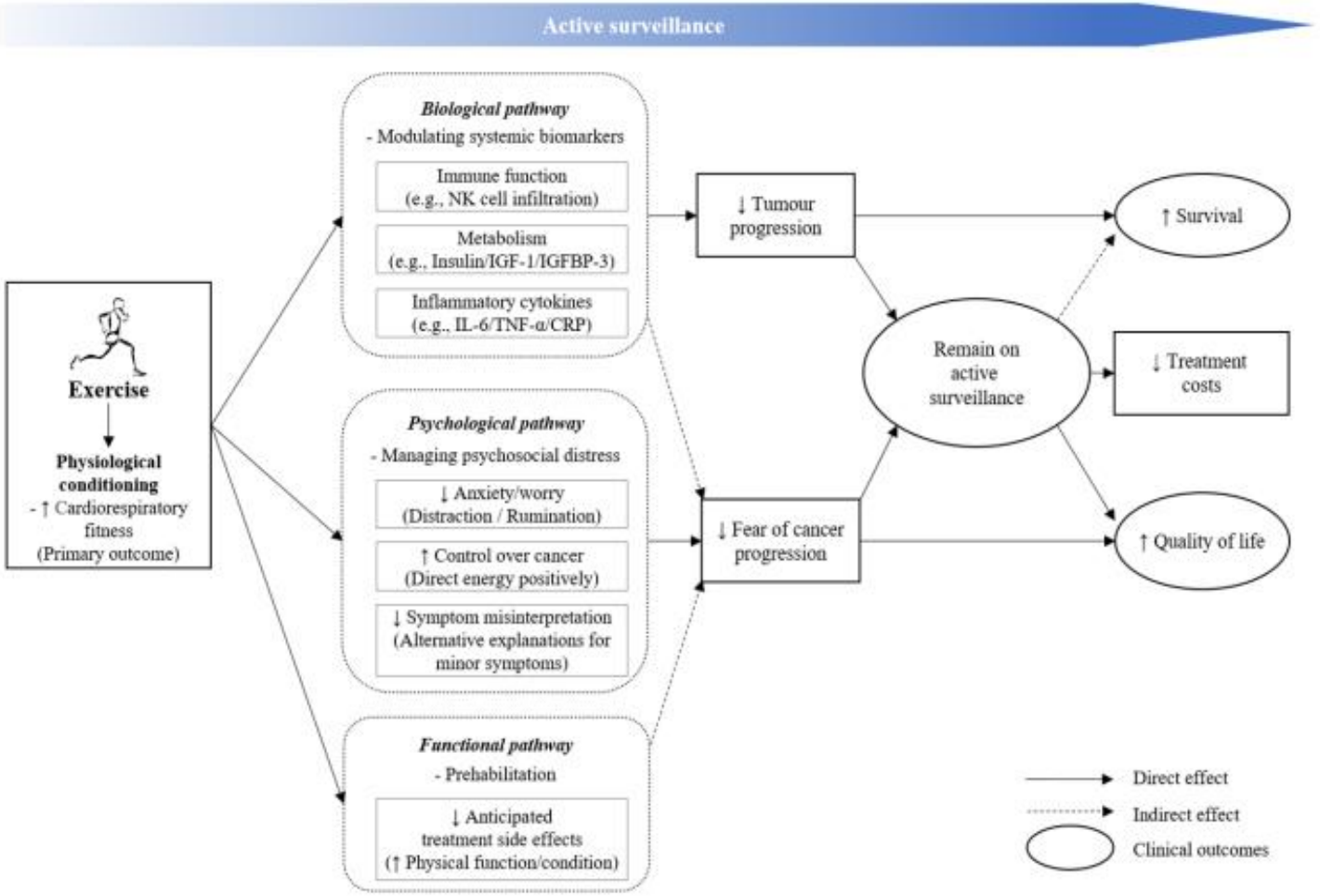
Open access Protocol

BMJ Open

Exercise duRing Active Surveillance for prostatE cancer—the ERASE trial: a study protocol of a phase II randomised controlled trial

Dong-Woo Kang,[1] Adrian S Fairey,[2] Normand G Boulé,[1] Catherine J Field,[3] Kerry S Courneya[1]

(Kang et al. *BMJ Open* 2019;9:e026438)



NK cell, natural killer cell; IGF, insulin-like growth factor; IGFBP, insulin-like growth factor binding protein; IL, interleukin; TNF, tumor necrosis factor; CRP, c-reactive protein

Figure 1 Proposed effects of exercise during active surveillance in prostate cancer patients.

(Kang et al. *BMJ Open* 2019;9:e026438)

Research

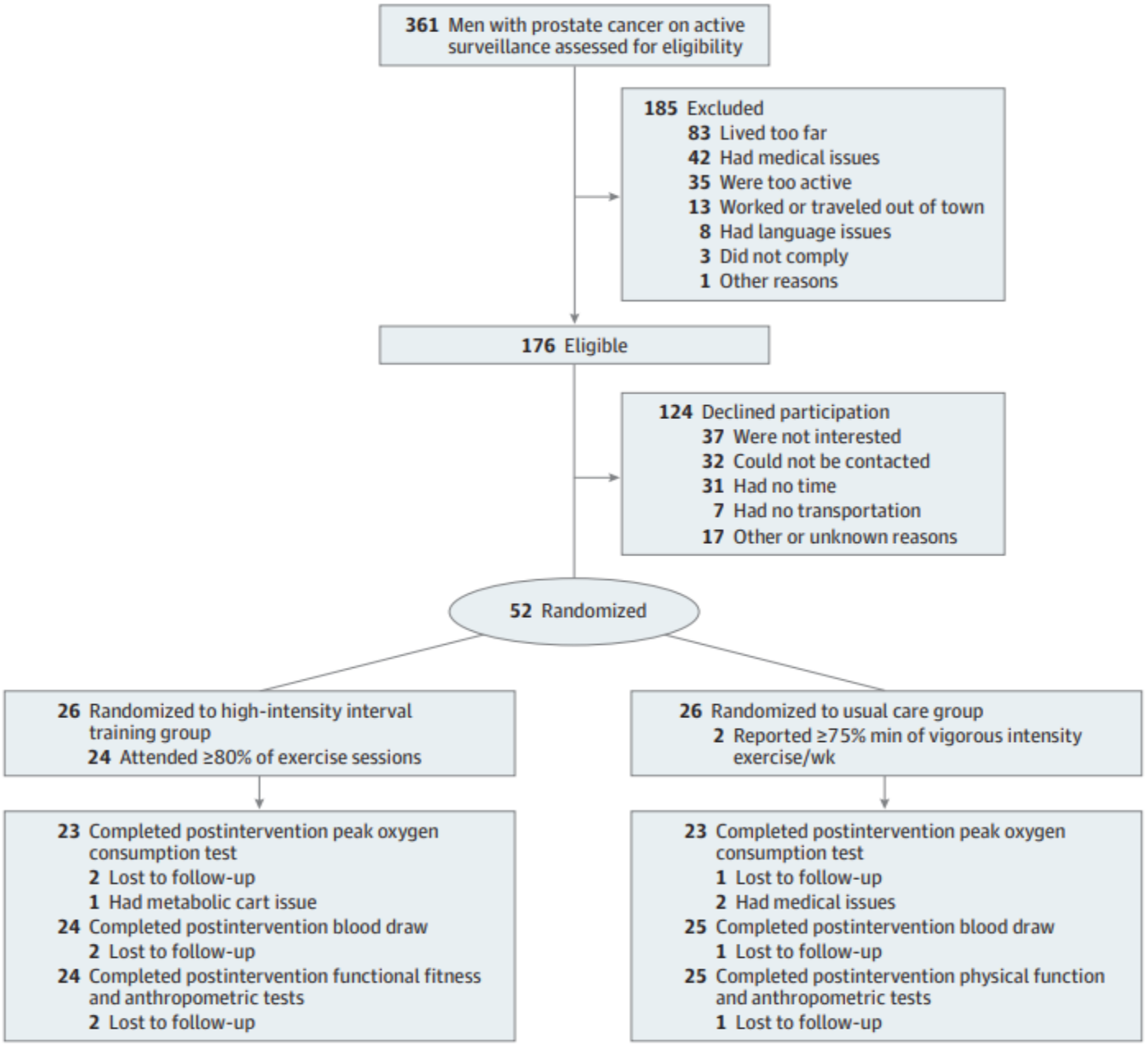
JAMA Oncology | Original Investigation

Effects of Exercise on Cardiorespiratory Fitness and Biochemical Progression in Men With Localized Prostate Cancer Under Active Surveillance
The ERASE Randomized Clinical Trial

Dong-Woo Kang, PhD; Adrian S. Fairey, MD; Normand G. Boulé, PhD; Catherine J. Field, PhD; Stephanie A. Wharton, BSc; Kerry S. Courneya, PhD

(Kang et al. *JAMA Oncol* 2021;7:1487-95)

Figure 1. CONSORT Diagram



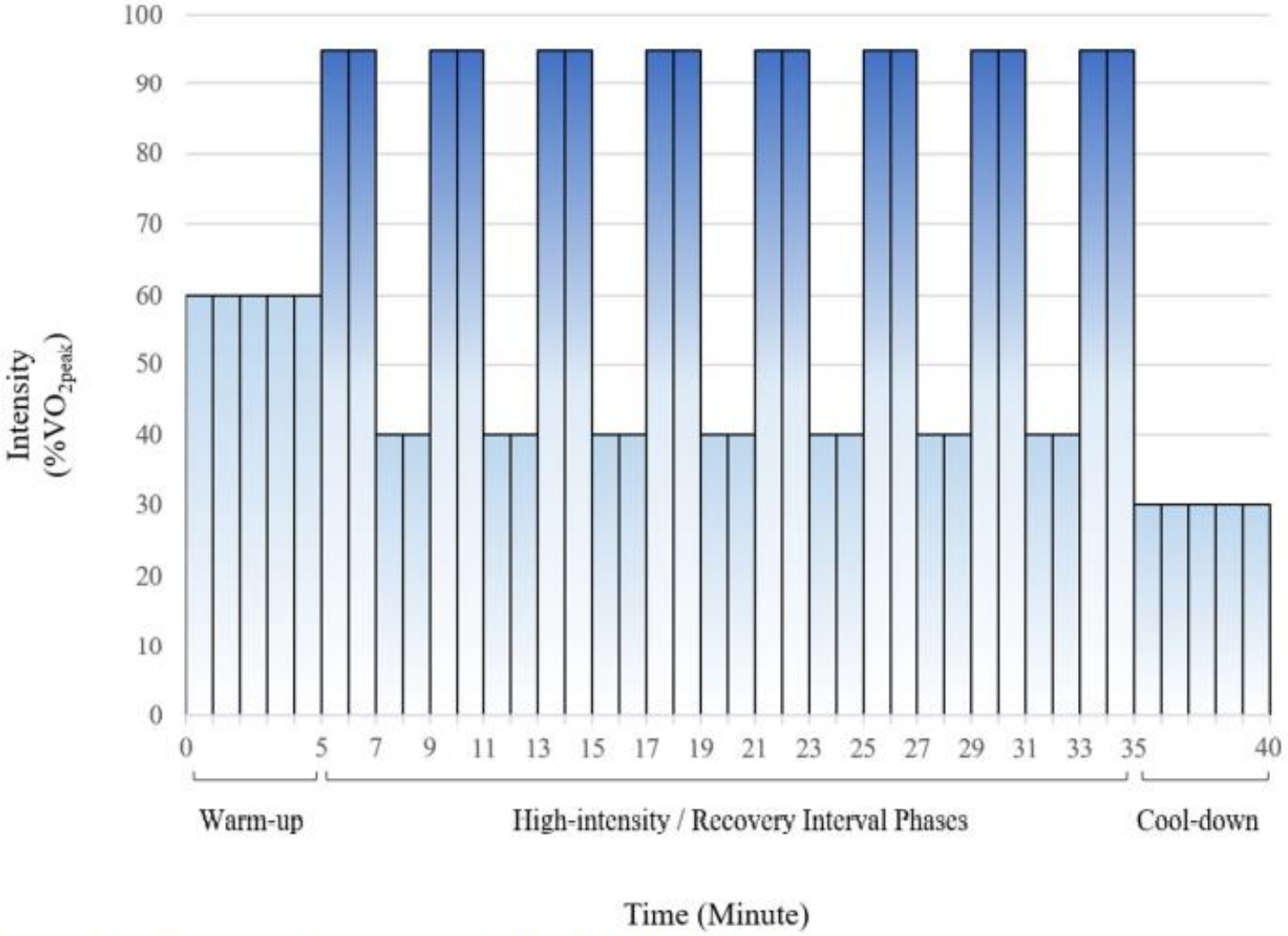


Figure 3 High-intensity interval training programme in the ERASE Trial.

Kang D-W, *et al*. *BMJ Open* 2019;**9**:e026438. doi:10.1136/bmjopen-2018-026438

(Kang et al. *BMJ Open* 2019;9:e026438)

Peak oxygen consumption among men under active surveillance for prostate cancer

With high-intensity interval training

↑ 0.9 mL/kg/min

With usual care

↓ 0.5 mL/kg/min

Healio

Figure 2. Changes in Prostate-Specific Antigen (PSA), PSA Doubling Time, PSA Velocity, and Testosterone

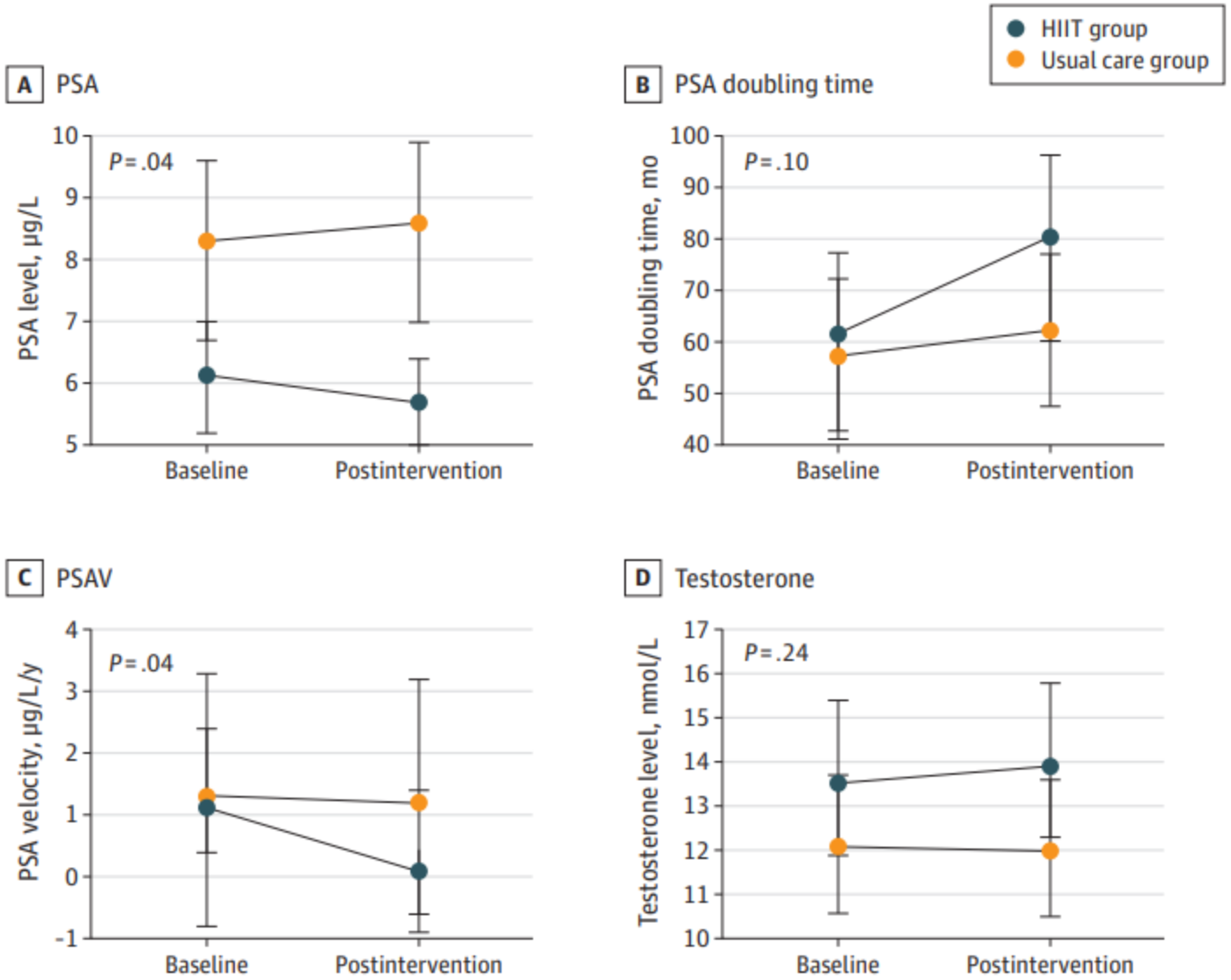
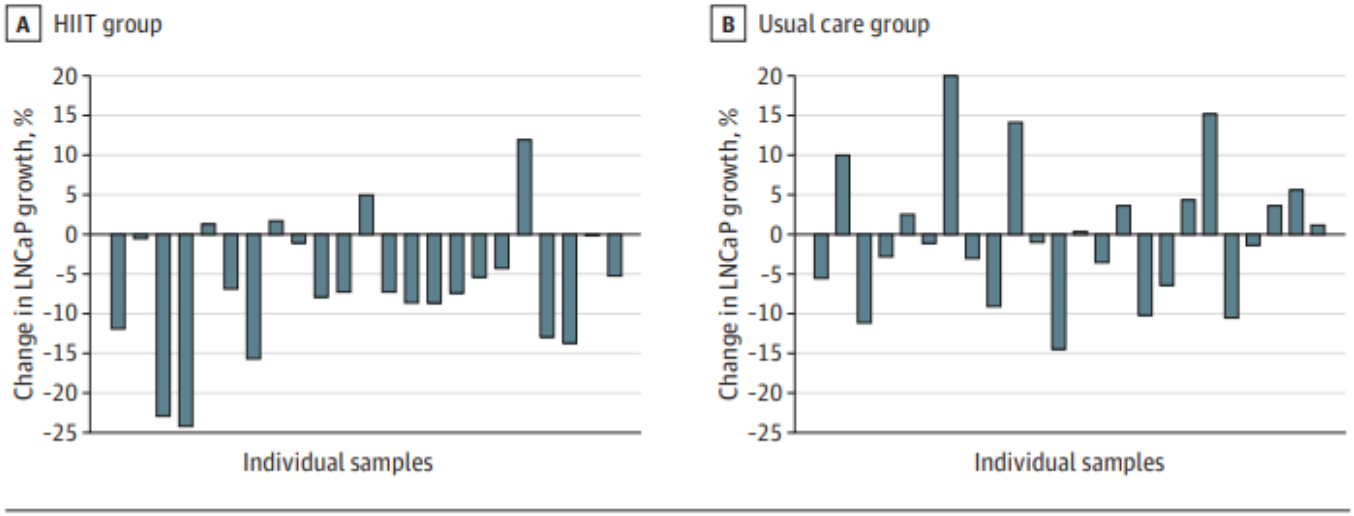


Figure 3. Changes in LNCaP Cell Line Growth



Each bar represents the unadjusted change in LNCaP cell line growth in each participant from baseline to the postintervention period. The overall percentage of mean difference between the high-intensity interval training (HIIT) and usual care groups was statistically significant (−5.1%; $P = .02$). The analysis was adjusted for the baseline values and resistance exercise behavior.

(Kang et al. *JAMA Oncol* 2021;7:1487-95)

Can Working Out Slow Prostate Cancer Progression?

— Intense exercise improved markers of biochemical progression in patients on active surveillance

by Mike Bassett, Staff Writer, MedPage Today August 19, 2021

Rigorous exercise not only boosted cardiorespiratory fitness, but also improved indicators of prostate cancer biochemical progression in patients undergoing active surveillance, according to results of a randomized trial.

A randomized trial of the effects of exercise on anxiety, fear of cancer progression, and quality of life in prostate cancer patients on active surveillance

Dong-Woo Kang, Adrian S. Fairey, Normand G. Boulé, Catherine J. Field,

Stephanie A. Wharton, and Kerry S. Courneya

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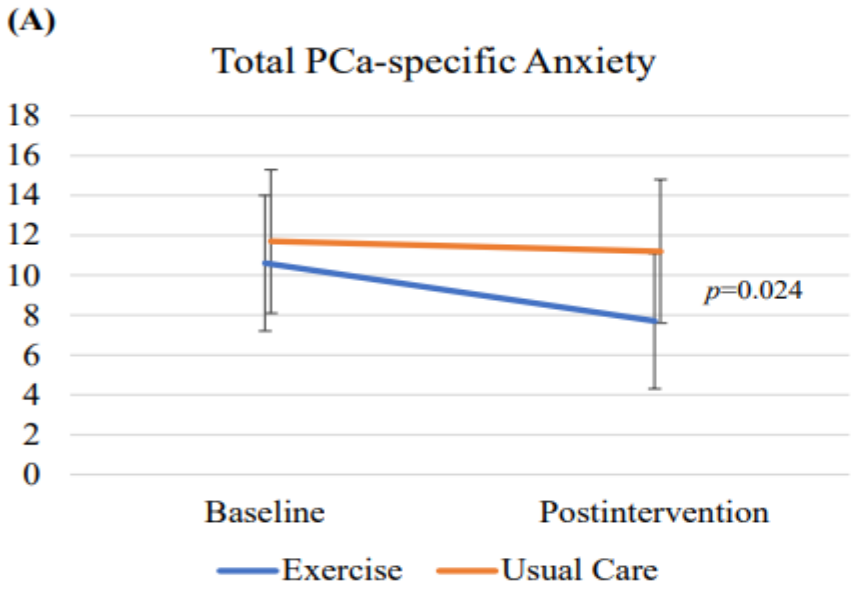
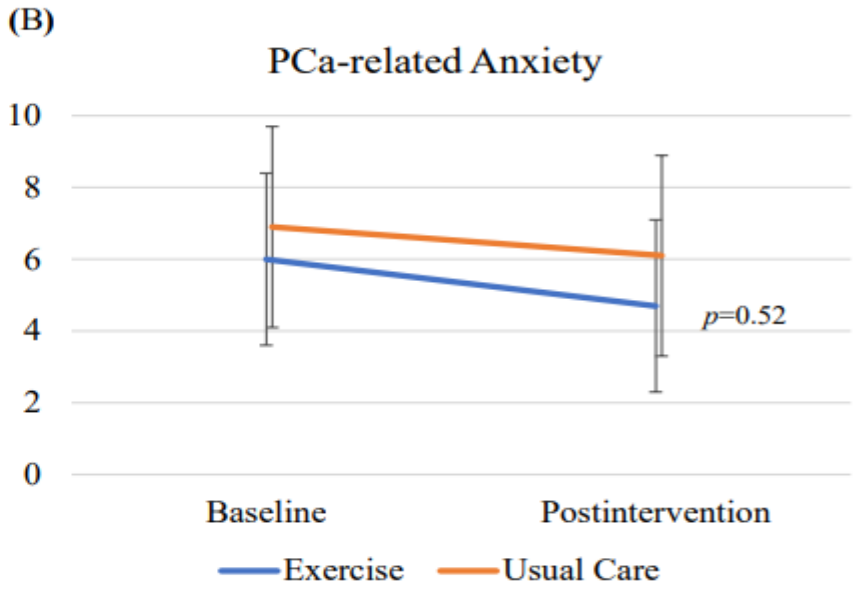
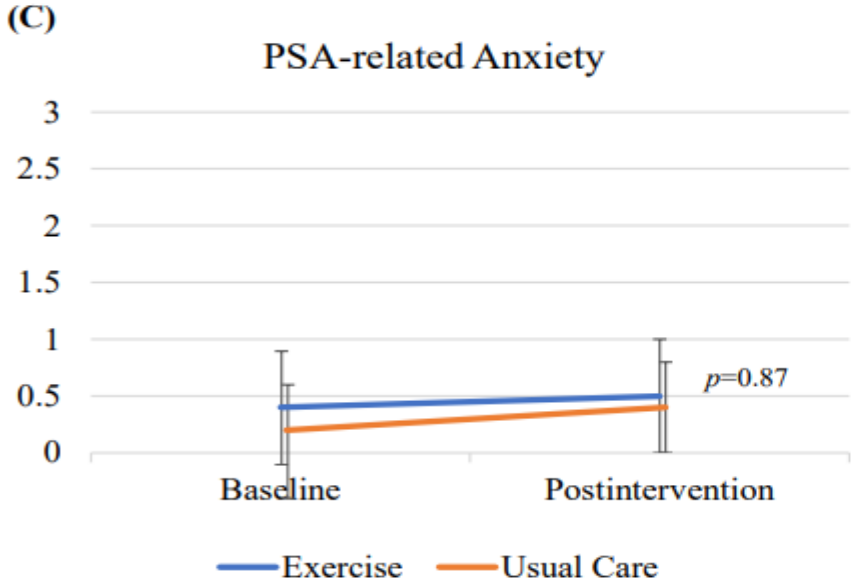
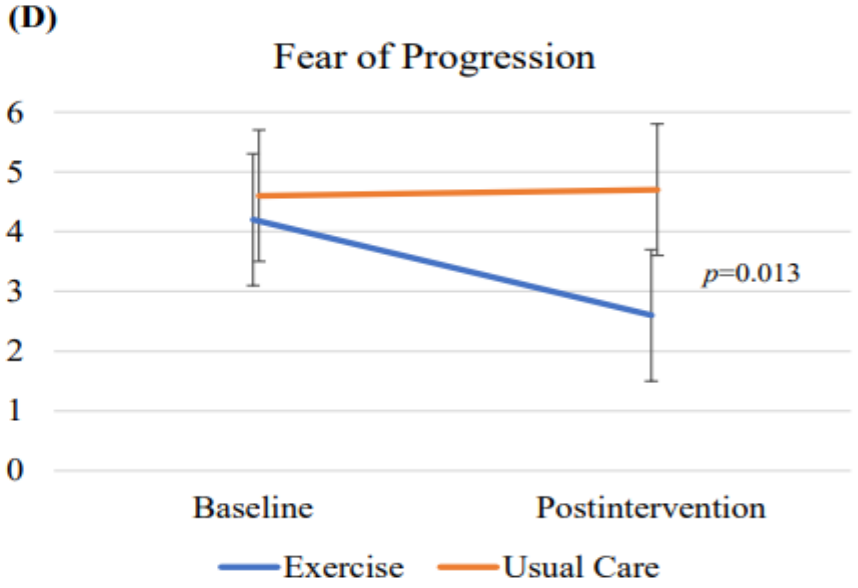
(Kang et al. *J Urol* in press)

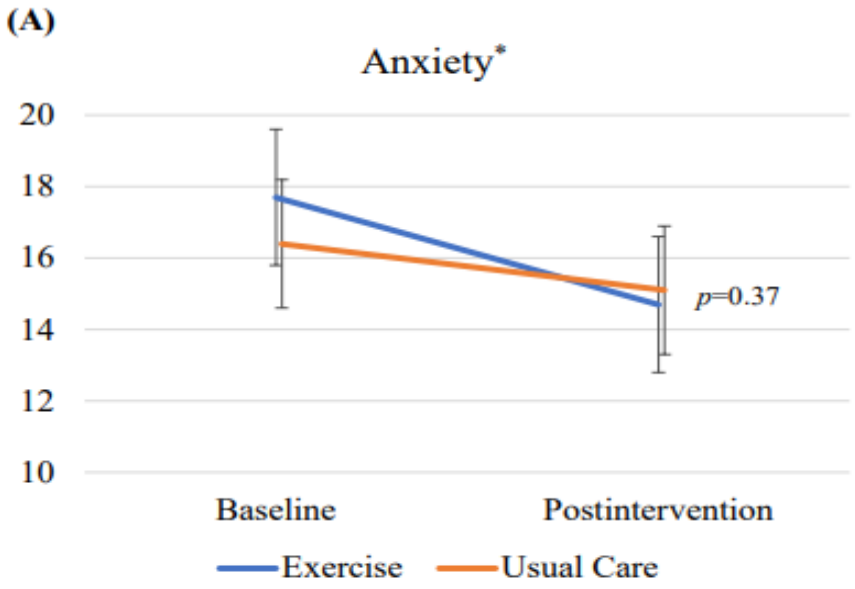


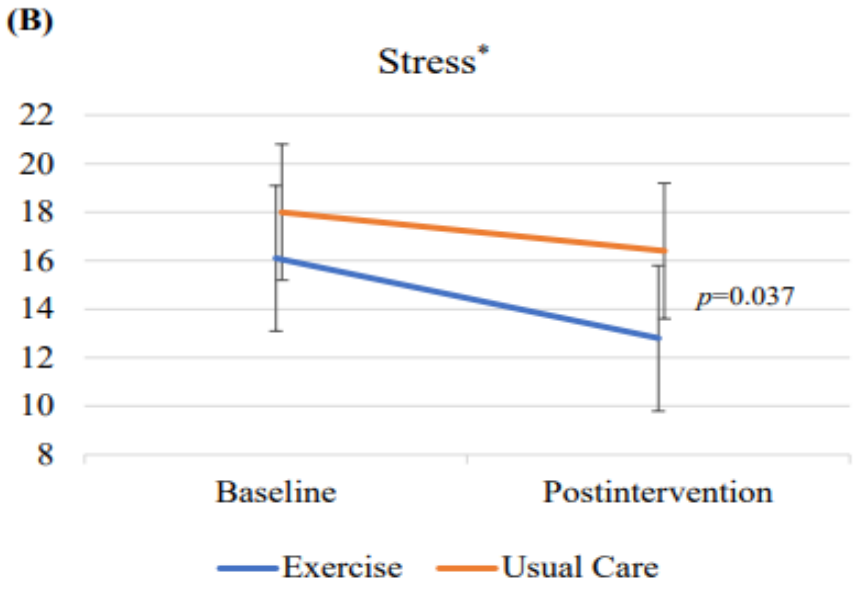


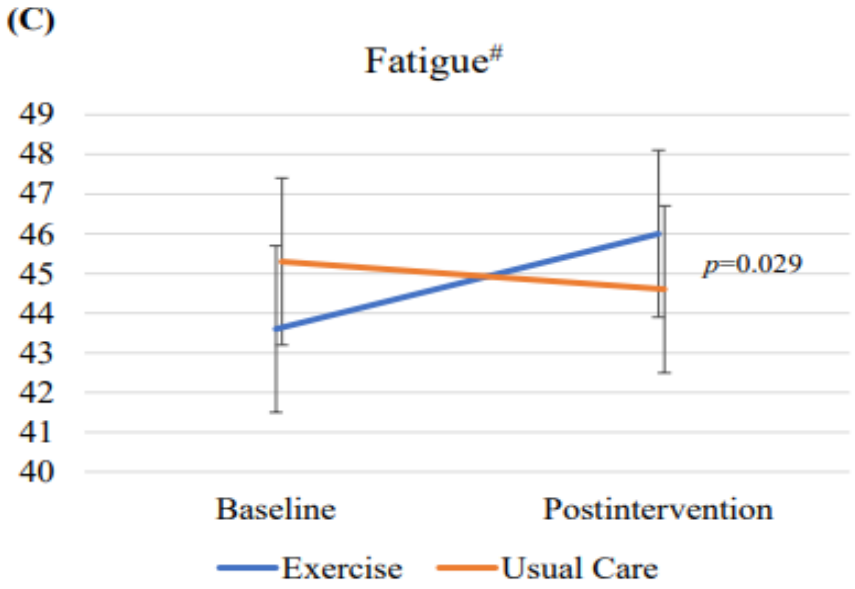


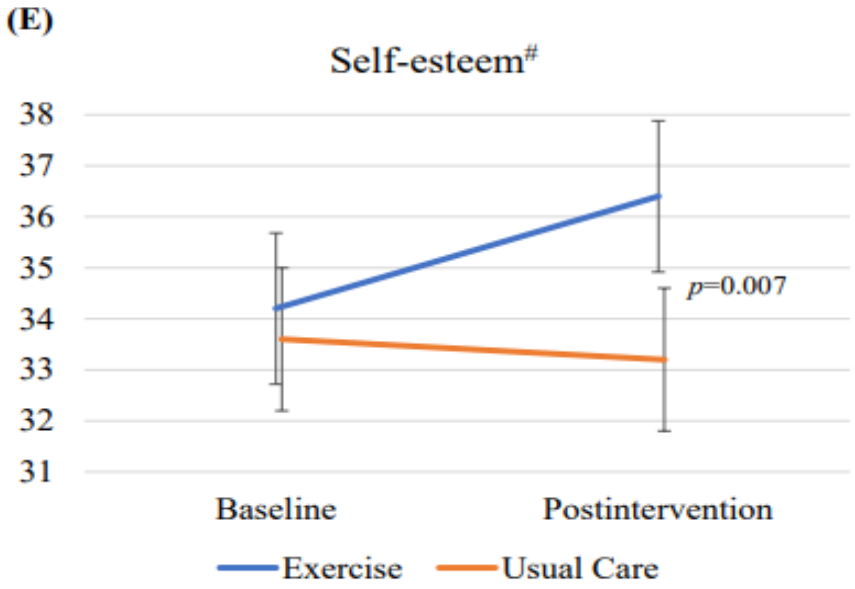


(Kang et al. *J Urol* in press)









(Kang et al. *J Urol* in press)

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ORIGINAL REPORT

Randomized Controlled Trial of Resistance or Aerobic Exercise in Men Receiving Radiation Therapy for Prostate Cancer

Roanne J. Segal, Robert D. Reid, Kerry S. Courneya, Ronald J. Sigal, Glen P. Kenny, Denis G. Prud'Homme, Shawn C. Malone, George A. Wells, Chris G. Scott, and Monika E. Slovinec D'Angelo

(Segal et al. *JCO* 2009; 27:344-351)

Prostate Cancer Radiotherapy and Exercise Versus Normal Treatment (PREVENT)

- RCT comparing 24 weeks of AET or RET to UC on fatigue, QoL, and fitness in 121 prostate cancer patients receiving RT ± ADT.

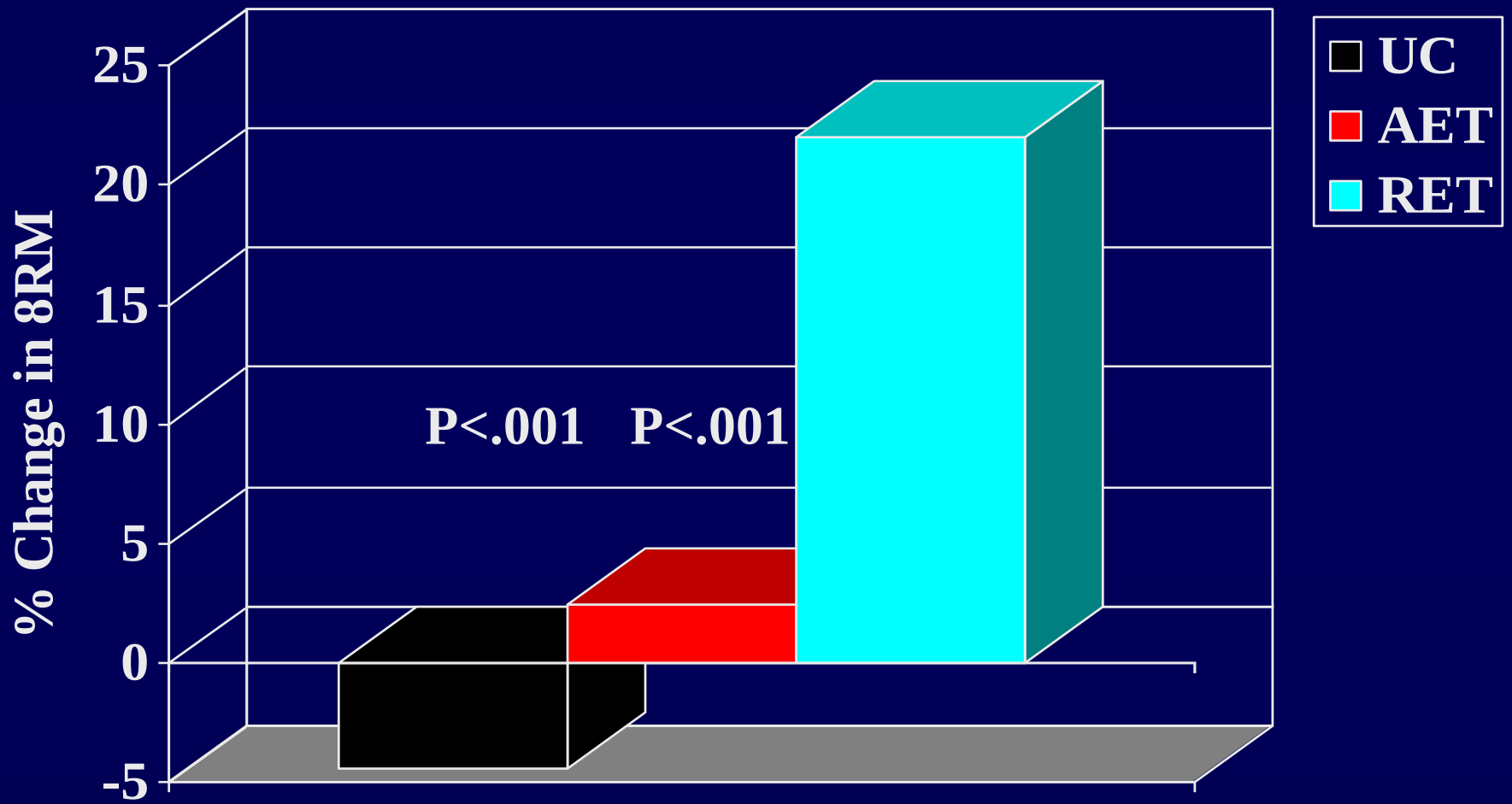
(Segal et al. *JCO* 2009; 27:344-351)

Exercise Training Interventions

- **AET: 3/week on bike, treadmill, or elliptical beginning at 60% peak for 15 min. and progressing to 80% for 45 min.**
- **RET: 3/week two sets of 8-12 repetitions of 9 different exercises at 60-70% of estimated 1 repetition maximum.**
- **UC: no structured exercise.**
- **AET, RET attended 83% and 88% of exercise sessions.**

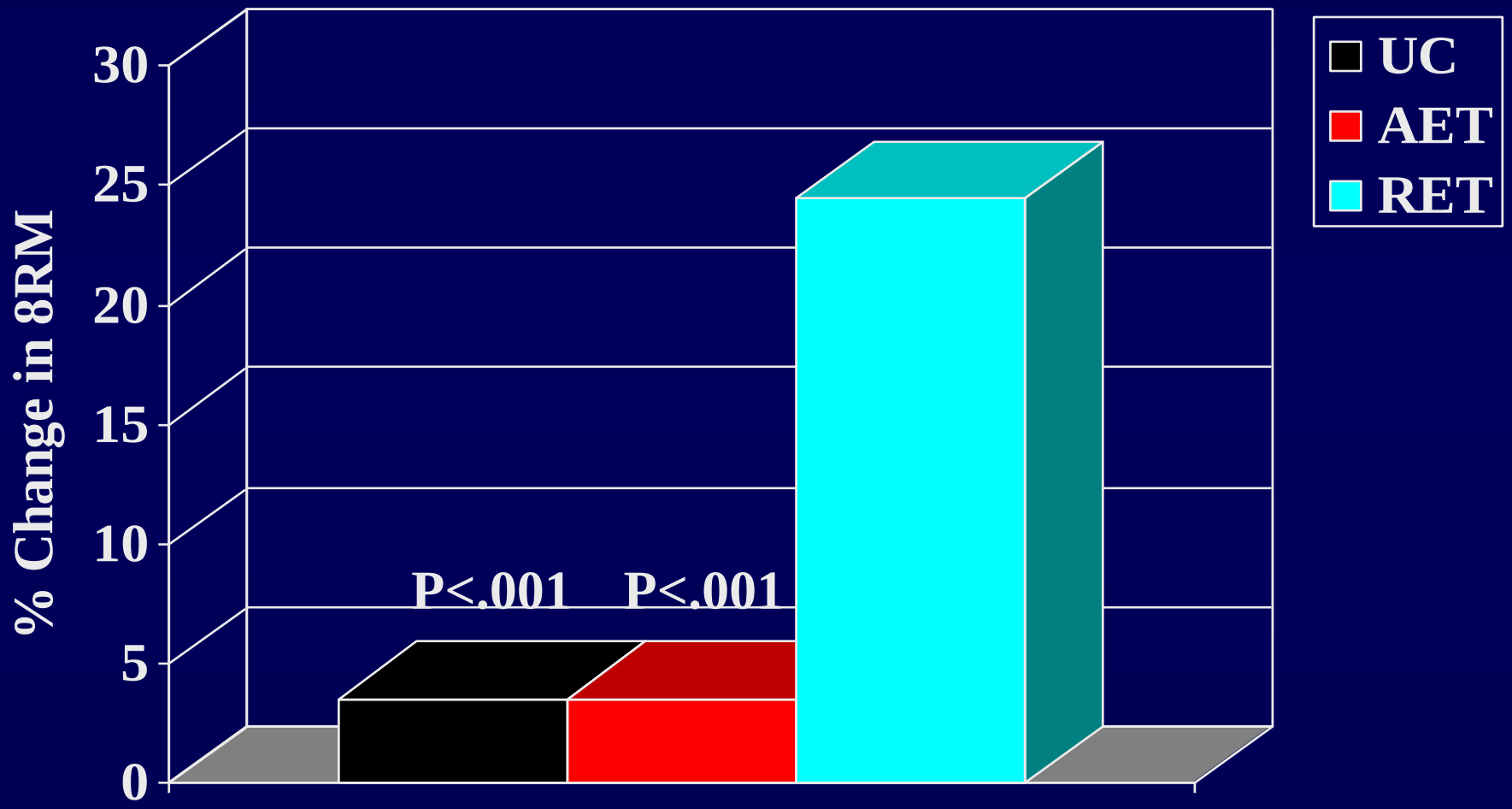
(Segal et al. *JCO* 2009; 27:344-351)

Change in Upper Body Strength



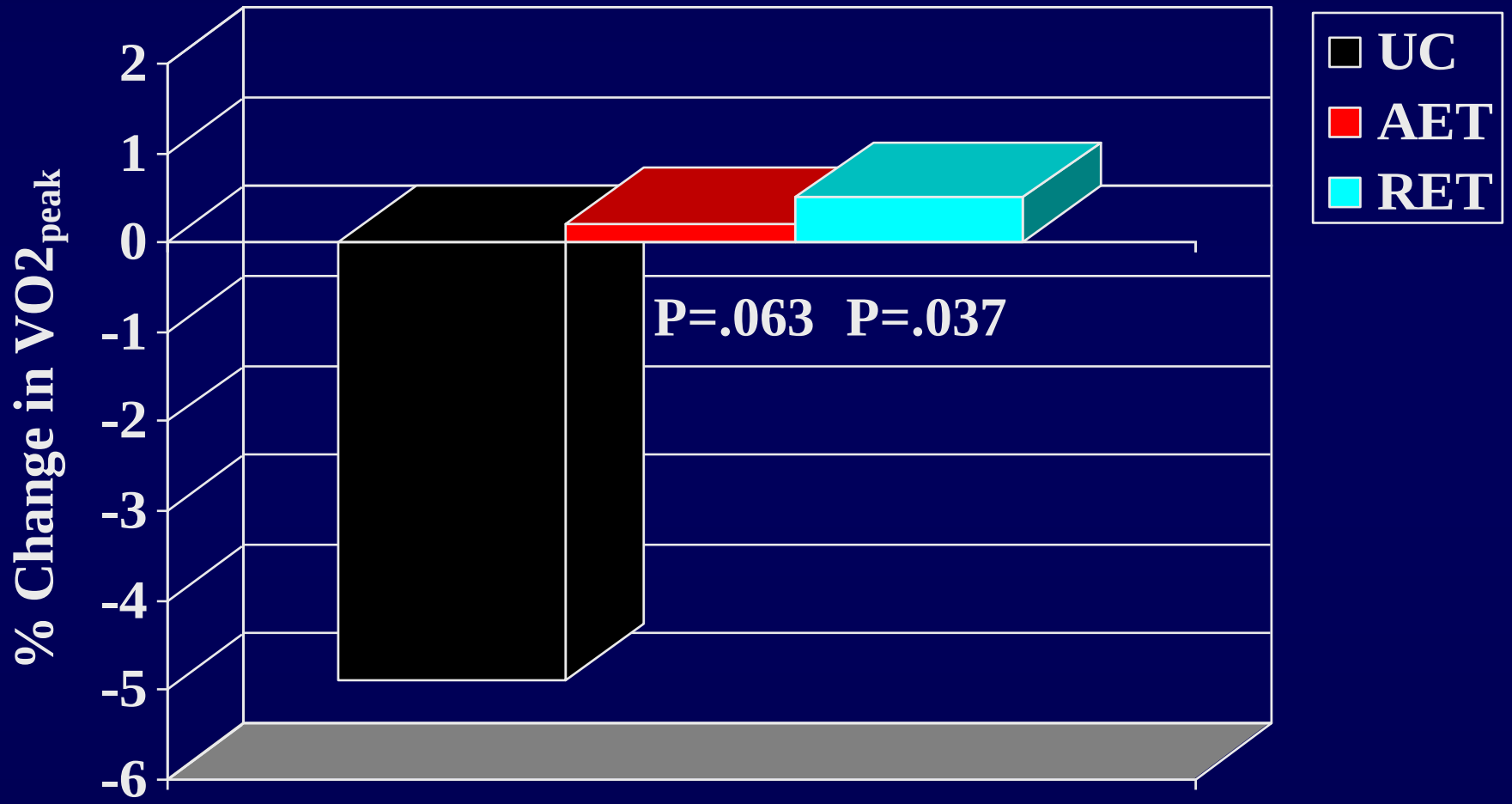
(Segal et al. *JCO* 2009; 27:344-351)

Change in Lower Body Strength



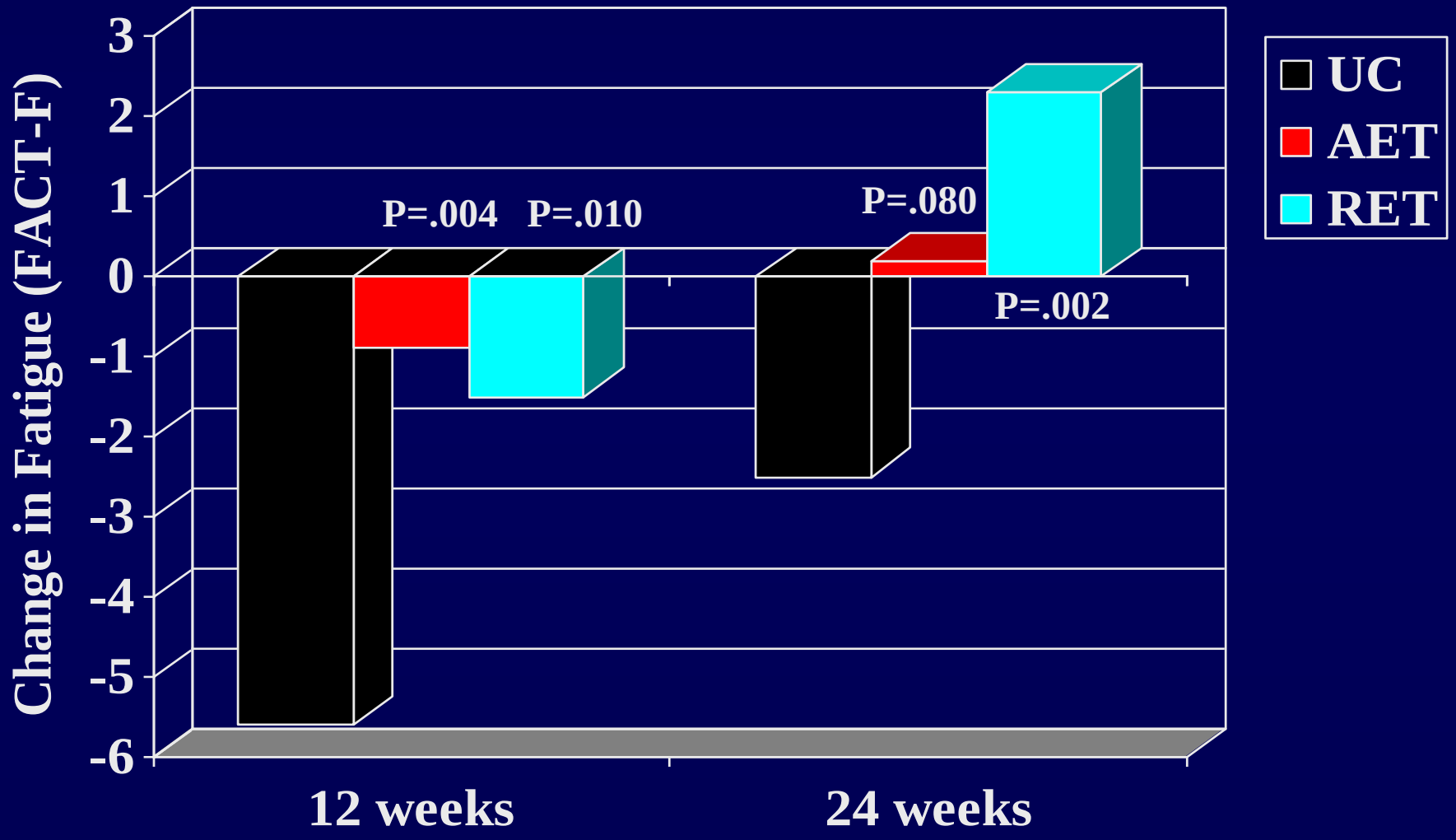
(Segal et al. *JCO* 2009; 27:344-351)

Change in Aerobic Fitness



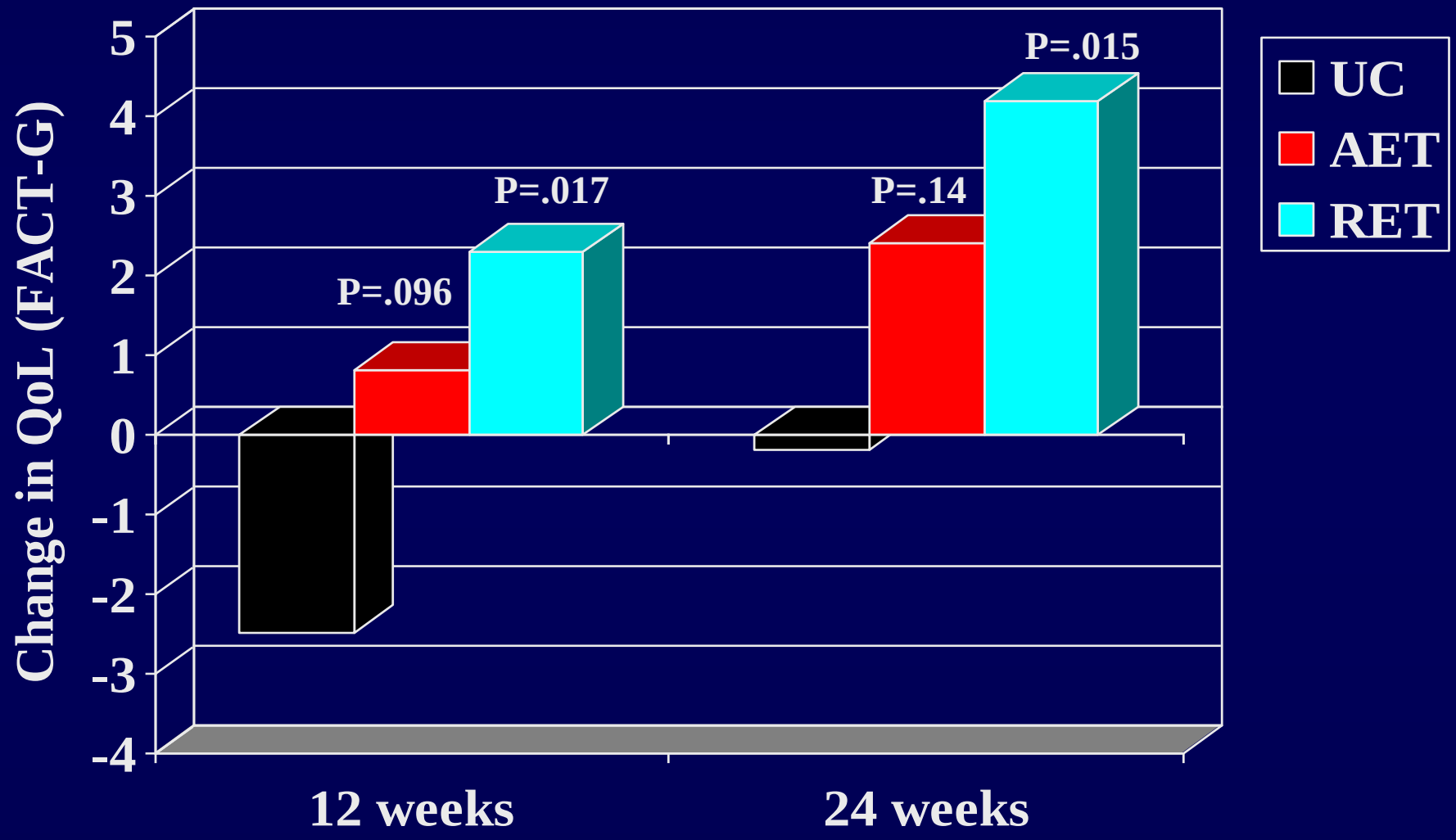
(Segal et al. *JCO* 2009; 27:344-351)

Change in Fatigue



(Segal et al. *JCO* 2009; 27:344-351)

Changes in Quality of Life



(Segal et al. *JCO* 2009; 27:344-351)

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European Association of Urology

Platinum Priority – Prostate Cancer

Editorial by Robert U. Newton and Daniel A. Galvão on pp. 586–587 of this issue

Physical Activity and Survival After Prostate Cancer

Christine M. Friedenreich [a,b,c,], Qinggang Wang [a], Heather K. Neilson [a], Karen A. Kopciuk [a,b,d], S. Elizabeth McGregor [b,c,e], Kerry S. Courneya [f]*

[a] *Department of Cancer Epidemiology and Prevention Research, CancerControl Alberta, Alberta Health Services, Calgary, Alberta, Canada;* [b] *Department of Oncology, Cumming School of Medicine, University of Calgary, Calgary, Alberta, Canada;* [c] *Department of Community Health Sciences, Cumming School of Medicine, University of Calgary, Calgary, Alberta, Canada;* [d] *Department of Mathematics and Statistics, Faculty of Science, University of Calgary, Calgary, Alberta, Canada;* [e] *Division of Population, Public and Aboriginal Health, Alberta Health Services, Calgary, Alberta, Canada;* [f] *Faculty of Physical Education and Recreation, University of Alberta, Edmonton, Alberta, Canada*

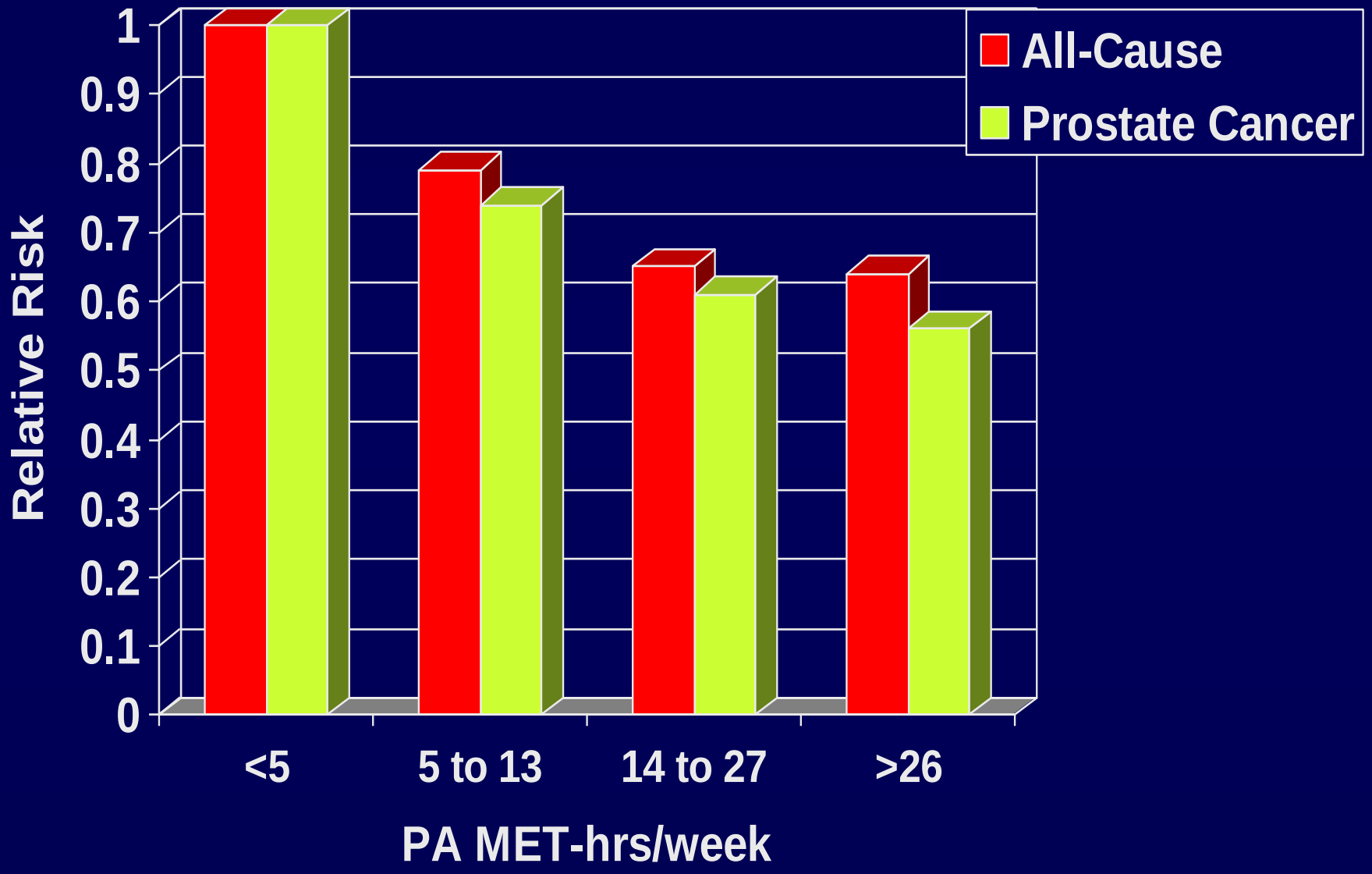
(Friedenreich et al. *Eur Urol* 2016;70:576-85)

PA and Prostate Cancer Survival

- 830 men diagnosed with stage I-III prostate cancer in 1997-2000 and followed until Oct. 2014.
- PA assessed at diagnosis and every 2 years after using the LTPAQ and converted to MET hours.
- adjusted for disease and treatment variables as well as diet and body mass index.
- 577 deaths; 236 prostate deaths; 401 recurrences.

(Friedenreich et al. *Eur Urol* 2016;70:576-85)

MV Adjusted RR of Death



(Friedenreich et al. *Eur Urol* 2016;70:576-85)

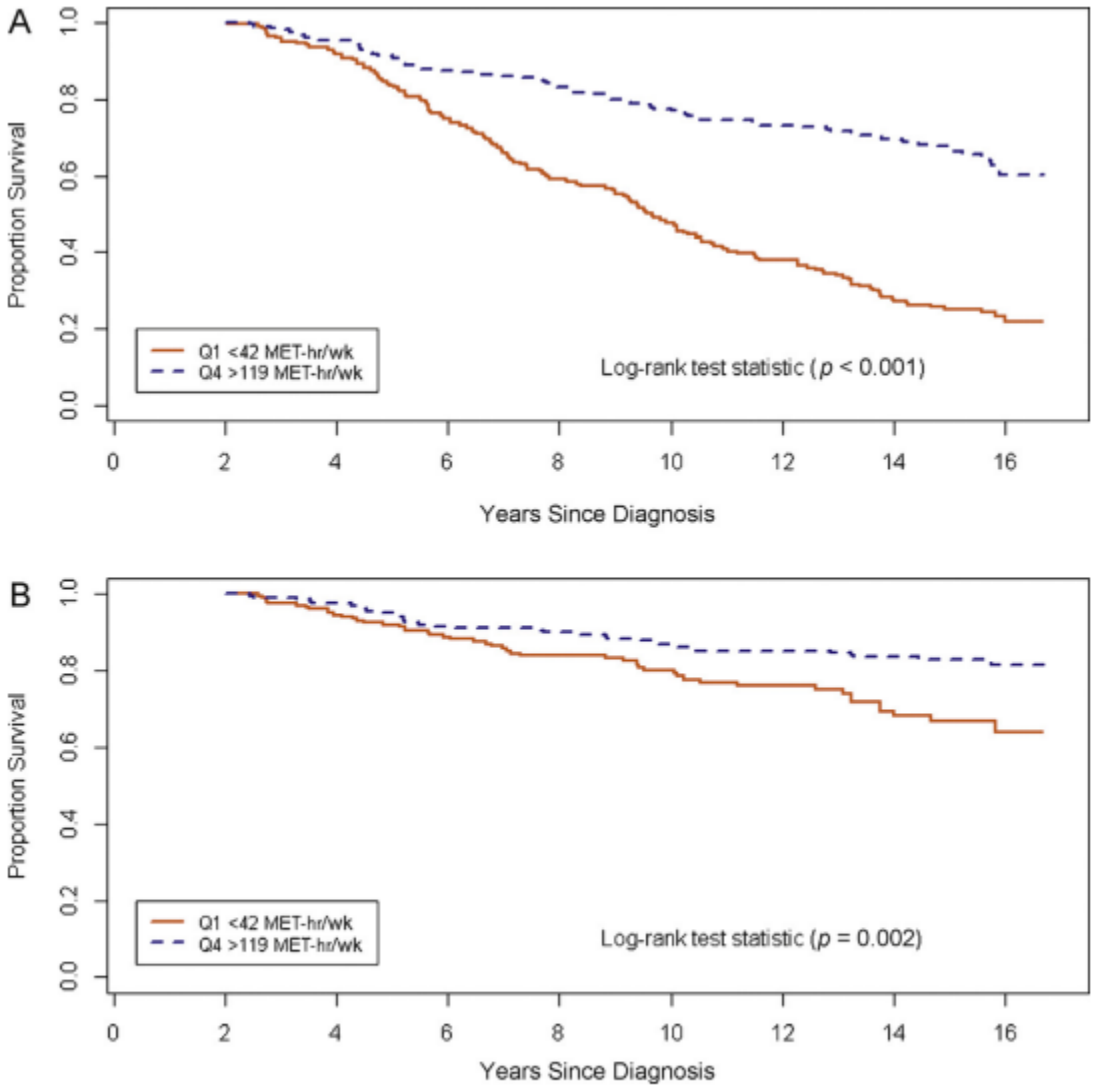


Fig. 2 – Kaplan-Meier curves for postdiagnosis total physical activity in relation to (A) all-cause mortality and (B) prostate cancer–specific death in the Prostate Cohort Study, Alberta, Canada, 1997–2014.
MET = metabolic equivalent; Q = quartile.

(Friedenreich et al. *Eur Urol* 2016;70:576-85)

Exercise Guidelines for Cancer Survivors

(and prostate cancer patients on active surveillance?)

SPECIAL COMMUNICATIONS

Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable

KRISTIN L. CAMPBELL[1], KERRI M. WINTERS-STONE[2], JOACHIM WISKEMANN[3], ANNE M. MAY[4], ANNA L. SCHWARTZ[5], KERRY S. COURNEYA[6], DAVID S. ZUCKER[7], CHARLES E. MATTHEWS[8], JENNIFER A. LIGIBEL[9], LYNN H. GERBER[10,11], G. STEPHEN MORRIS[12], ALPA V. PATEL[13], TRISHA F. HUE[14], FRANK M. PERNA[15], and KATHRYN H. SCHMITZ[16]

[1]Department of Physical Therapy, Faculty of Medicine, University of British Columbia, Vancouver, CANADA; [2]School of Nursing and Knight Cancer Institute, Oregon Health Sciences University, Portland, OR; [3]Division of Medical Oncology, National Center for Tumor Diseases (NCT) and Heidelberg University Clinic, Heidelberg, GERMANY; [4]Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, Utrecht University, Utrecht, THE NETHERLANDS; [5]School of Nursing, Northern Arizona University, Flagstaff, AZ; [6]Faculty of Kinesiology, Sport, and Recreation, University of Alberta, Edmonton, CANADA; [7]Cancer Rehabilitation Medicine Services, Swedish Cancer Institute, Swedish Health Services, Seattle, WA; [8]Metabolic Epidemiology Branch, Division of Cancer Epidemiology and Genetics, National Cancer Institute, Rockville, MD; [9]Havard Medical School, Boston, MA; [10]Department of Medicine, Inova Fairfax Medical Campus, Falls Church, VA; [11]Center for the Study of Chronic Illness and Disability, George Mason University, Fairfax, VA; [12]Physical Therapy, Wingate University, Wingate, NC; [13]Epidemiology Research, American Cancer Society, Atlanta, GA; [14]Department of Epidemiology and Biostatistics, University of California San Francisco, San Francisco, CA; [15]Division of Cancer Control and Population Sciences, Behavioral Research Program, Health Behaviors Research Branch, National Cancer Institute, Rockville, MD; and [16]Public Health Science, Penn State Cancer Institute, Penn State College of Medicine, Hershey, PA

(Campbell et al. *MSSE* 2019;51:2375-90)

CA CANCER J CLIN 2012;62:242-274

Nutrition and Physical Activity Guidelines for Cancer Survivors

Cheryl L. Rock, PhD, RD[1]; Colleen Doyle, MS, RD[2]; Wendy Demark-Wahnefried, PhD, RD[3]; Jeffrey Meyerhardt, MD, MPH[4]; Kerry S. Courneya, PhD[5]; Anna L. Schwartz, FNP, PhD, FAAN[6]; Elisa V. Bandera, MD, PhD[7]; Kathryn K. Hamilton, MA, RD, CSO, CDN[8]; Barbara Grant, MS, RD, CSO, LD[9]; Marji McCullough, ScD, RD[10]; Tim Byers, MD, MPH[11]; Ted Gansler, MD, MBA, MPH[12]

Cancer survivors are often highly motivated to seek information about food choices, physical activity, and dietary supplements to improve their treatment outcomes, quality of life, and overall survival. To address these concerns, the American Cancer Society (ACS) convened a group of experts in nutrition, physical activity, and cancer survivorship to evaluate the scientific evidence and best clinical practices related to optimal nutrition and physical activity after the diagnosis of cancer. This report summarizes their findings and is intended to present health care providers with the best possible information with which to help cancer survivors and their families make informed choices related to nutrition and physical activity. The report discusses nutrition and physical activity guidelines during the continuum of cancer care, briefly highlighting important issues during cancer treatment and for patients with advanced cancer, but focusing largely on the needs of the population of individuals who are disease free or who have stable disease following their recovery from treatment. It also discusses select nutrition and physical activity issues such as body weight, food choices, food safety, and dietary supplements; issues related to selected cancer sites; and common questions about diet, physical activity, and cancer survivorship. **CA Cancer J Clin 2012;62:242-274.**

(Rock et al. *CA Cancer J Clin* 2012;62:242-274)

General Exercise Principles

- avoid inactivity; sedentary behavior may be bad.
- some exercise is better than none.
- more exercise is better (dose-response).
- start easy and progress slowly.
- exercise must be individualized based on patient function, side effects, preferences, and goals.

Exercise Prescription Components

- type or mode of activity.
- total weekly amount or volume.
- frequency, intensity, duration.
- context (physical and social environment).

Type or Mode of Activity

- aerobic (endurance) and strength (resistance).
- both are recommended and are complementary.
- consider acute/chronic treatment side effects.
- variety is encouraged (cross-training).
- walking is good if no preference.

Weekly Exercise Volume

- 150-300 mins/week of moderate intensity aerobic EX.
- 75-150 mins/week of vigorous intensity aerobic EX.
- or a combination of mod and vig minutes.
- 2-3 days/week of strength exercises of major muscle groups using 8-12 repetitions; 3 days of balance.

Exercise Prescription

- frequency of 3-7 days/week.
  - 3 x 50 or 5 x 30 or 7 x 20 minutes.
- durations of ≥ 10 continuous minutes.
  - 3 x 10 minutes or 2 x 15 minutes or 1 x 30 minutes.
- intensity of ≥ moderate.
  - light sweating, increased HR/breathing, talk but not sing.
  - brisk walking (late for an appointment).
  - change clothes and shower.

“Lifestyle” Activities

- “lifestyle” or “baseline” activities are encouraged but are not considered part of the guidelines.
- walking from the parking lot, taking the stairs, washing the dishes, walking to the bus stop, etc.
- activities of daily living should be viewed as “activity supplements”.

Does the Exercise Context Matter?

- the physical and social environment may be important for optimizing psychosocial benefits and improving long term exercise adherence.
- key is that EX should engage the mind and spirit; not just the body - avoid “mindless” activities.

Walking Example

- Bad - treadmill in unfinished basement.
- Good - treadmill while listening to music/TV.
- Better - walking around your neighborhood.
- Best - walking in a park/hiking with friends.

Don’t Take Cancer Lying Down!