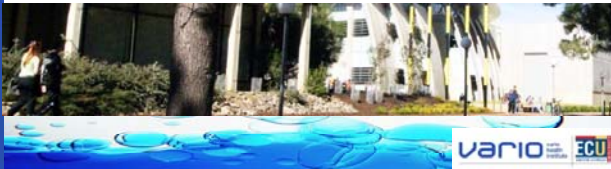


Exercise as Medicine for Cancer

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www.varioinstitute.org

12th August 2006



“There is no pharmacological intervention that holds a greater promise of improving health and promoting independence in the elderly than does exercise”

Evans & Campbell, Journal of Nutrition, 1993

Research Review of Exercise and Cancer Studies

- 26 published studies pre and post intervention
- 18 during cancer treatment
 - 14 cardiovascular training
 - 2 mixed cardiovascular and flexibility
 - 2 resistance training (RT)
- 8 after cancer treatment
 - 4 cardiovascular training
 - 4 cardiovascular, RT and flexibility

Galvao and Newton, Journal of Clinical Oncology, 2005

Range of cancers

- 12 of 26 studies exclusively breast cancer
- 5 breast plus mixed
- remainder non-breast cancer



General Increases

- lean tissue mass
- VO2max
- maximum walk distance
- natural killer cell cytotoxic activity
- physical function
- flexibility
- muscle strength
- QOL
- hemoglobin



General Decreases...1

- nausea
- body fat
- fatigue
- symptom experience
- duration of thrombopenia and neutopenia
- duration of hospitalization
- lactate concentration
- resting and exercise heart rate
- resting systolic blood pressure



General Decreases...2

- psychological and emotional stress
- depression and anxiety



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Current Research – Galvão, Newton & Spry

- 36 weeks ADT 72 men prostate cancer
- Decreases lean mass upper limb (5.6%), lower limb (3.7%), trunk (1.4%), whole body (2.4%)
- Fat mass increased 20.7%, 18.7%, 12.0%, and 13.8%



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Current Research – Galvão, Newton & Spry

- Bone Mineral Density decreased Hip (1.5%), spine (3.9%), whole body (2.4%)
- physical activity levels decreased
- levels of fatigue increased
- “double whammy” for fall and fracture



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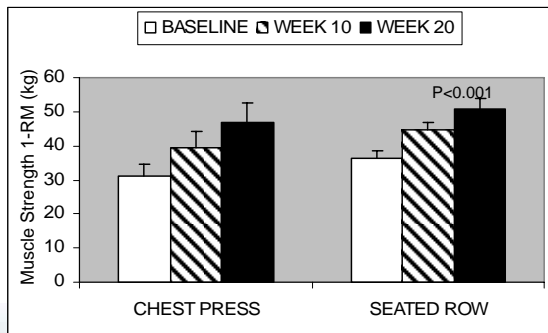
Current Research – Galvão, Newton et al

- 20 weeks RT, 11 men on ADT for prostate cancer
- Significant improvements muscle strength (24-40%), endurance (51-106%), walking ability (4-21%), stair climb (8%), chair rise (21%)
- Large and significant increase in dynamic balance ability – reduced falls risk



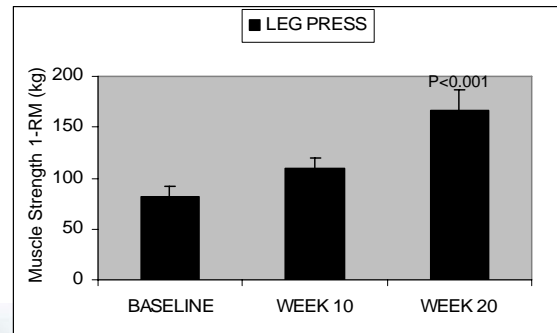
Galvao and Newton, MSSE, In Press 2006

Upper Body Strength (1-RM)



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Lower Body Strength (1-RM)



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Current Research – Galvão, Newton et al

- single acute exercise bout increased GH 0.4 to 3.3 ng/ml
- no change in testosterone or PSA

Variable	Baseline	Week 10	Week 20	p value
PSA (ng/ml)	3.0 ± 6.5	1.2 ± 1.5	1.8 ± 1.1	0.374
Free Testosterone (pg/ml)	2.3 ± 3.8	2.1 ± 3.6	1.5 ± 3.6	0.532
Total Testosterone (ng/ml)	1.1 ± 1.1	1.2 ± 1.3	0.7 ± 0.7	0.538
GH (ng/ml)	0.7 ± 0.7	0.8 ± 0.7	0.4 ± 0.3	0.239
Cortisol (ng/ml)	10.6 ± 3.5	10.3 ± 3.3	10.4 ± 2.4	0.979

Galvao and Newton, AAESS Conference, 2008

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Anabolic exercise offers one of the most potent interventions for improving the structure and function of the human



Optimising health through research

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- Consistent reports of large improvements in neuromuscular function
- Retards or reverses age and disease related sarcopenia and osteopenia
- Alleviate many symptoms
- Important adjuvant treatment
- Better tolerated than aerobic exercise
- Fits better with fatigue management program?

Why anabolic exercise for cancer patients?



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- Totally reject absolute rest strategy - We need to change our perceptions
- Must reverse our concept of “gentle exercise”
- Walking, housework, gardening less efficient stimulus

Deficiencies of some physical activity programs for cancer patients



Optimising health through research

Exercise Recommendations for Cancer Patients and Survivors

- Aerobic Exercise:
 - 3-5 days/week for 20-60 continuous minutes at a moderate intensity level (60-90% of maximal heart rate)
- Resistance (Anabolic) Exercise:
 - 2-3 sessions per week
 - at least one day between sessions
 - One set 8-12 reps for first 2 weeks, 2 sets weeks 3&4 and then 3-4 sets week 3 onward at intensity of 6-10RM for 6-9 functional exercises

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Design recommendations for exercise programs

- Progression
- Adequate intensity
- Periodized
- Exercise selection for functional improvement
- Sufficient recovery
- Planned within fatigue management program
- Integrated of relaxation, flexibility, nutrition aspects of lifestyle
- Specific to cancer and co-morbidities



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Exercise Scientist and Physiologist

- Referral to appropriate professional is critical
- Exercise scientists are minimum 3 year university educated
- EPs are 4 years + experience
- Certified by: Australian Association for Exercise and Sport Science (AAESS)
- Medicare Plus – 5 consultations

www.aaess.com.au

Australian Association for Exercise and Sports Science

Optimising health through research

STOP PRESS

Cancer Survival: Time to Get Moving? Data Accumulate Suggesting a Link Between Physical Activity and Cancer Survival

Journal of Clinical Oncology August 2006

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50 to 60% increased in survivorship!

- 2 large prospective studies in colorectal cancer published in Journal of Clinical Oncology by Meyerhardt et al 2006
- 9 to 18 + MET hours per week or 4-5 sessions of brisk walking 30-60 minutes per week



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Compared to Chemotherapy

- Data from these three observational studies suggest a reduced risk of recurrence of 50% to 60%.

“Such an effect parallels that of trastuzumab for HER-2–positive breast cancer patients, an agent heralded by the oncologic care community and by the Director of the National Cancer Institute, Andrew C. von Eschenbach, MD, as “a major advance and turning point in eliminating suffering and death from cancer.”

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Thank You

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www.varioinstitute.org

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