LET'S GET PHYSICAL: THE ROLE OF EXERCISE IN PROSTATE CANCER MANAGEMENT

Prue Cormie, PhD, AEP
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≥ 3 hours per week of **vigorous** activity after PCa diagnosis:

- 49% lower risk of all-cause mortality (p < 0.001)
  - HR 0.51; 95% CI 0.36 - 0.72
- 61% lower risk of prostate cancer mortality (p = 0.030)
  - HR 0.39; 95% CI 0.18 - 0.84

Kenfield et al. J Clinical Oncology 2011
TARGETED EXERCISE PRESCRIPTION

• Specific exercise prescription dictates the type and magnitude of physiological adaptations

Aerobic Exercise

Resistance Exercise

• The most significant benefits arise from targeted exercise prescription (individualised; monitored; appropriate exercise selection, volume & intensity; progressive)
EXERCISE TO PREVENT ADT TOXICITY

Can supervised exercise prevent treatment toxicity in patients with prostate cancer initiating androgen-deprivation therapy: a randomised controlled trial


<table>
<thead>
<tr>
<th>Treatment</th>
<th>Initiating ADT (previously: 29% RT, 21% PT) 6 days between 1st ADT injection &amp; baseline test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>RCT (Exercise vs. Usual Care)</td>
</tr>
<tr>
<td>Sample</td>
<td>63 men (age = 68.4 ± 7.1 years)</td>
</tr>
<tr>
<td>Intervention</td>
<td>3 months; group-based; AEP supervised</td>
</tr>
<tr>
<td>Protocol</td>
<td>Resistance &amp; aerobic exercise (2 x weekly)</td>
</tr>
<tr>
<td>Primary endpoint</td>
<td>Body composition (fat &amp; lean mass)</td>
</tr>
</tbody>
</table>

EXERCISE TO PREVENT ADT TOXICITY

Change over the 3-month intervention

- Fat Mass (kg): Exercise -0.1 kg, Usual Care 1.4 kg, \( p = 0.001 \)
- Trunk Adiposity (kg): Exercise 0.9 kg, Usual Care 1.3 kg, \( p = 0.008 \)
- Percent Fat (%): Exercise 0.7 kg, Usual Care 0.4 kg, \( p = 0.019 \)
- Lean Mass (kg): Exercise 0.7 kg, Usual Care 0.4 kg, \( p = 0.078 \)
- Appendicular Lean Mass (kg): Exercise 0.7 kg, Usual Care 0.4 kg, \( p < 0.001 \)
EXERCISE TO PREVENT ADT TOXICITY

Change over the 3-month intervention (%)

Muscular Strength  Cardiorespiratory Fitness  Sexual Functioning  Fatigue  Psychological Distress  Mental Health  Social Functioning

-60 -40 -20 0 20 40 60

p < 0.001  p = 0.004  p = 0.042  p = 0.045  p = 0.028  p = 0.006  p = 0.015
Can exercise ameliorate treatment toxicity during the initial phase of testosterone deprivation in prostate cancer patients? Is this more effective than delayed rehabilitation?

Robert U Newton\textsuperscript{1,}\textsuperscript{*}, Dennis R Taaffe\textsuperscript{1,2,3}, Nigel Spry\textsuperscript{1,4,5}, Prue Cormie\textsuperscript{1}, Suzanne K Chambers\textsuperscript{1,6}, Robert A Gardiner\textsuperscript{1,7}, David HK Shum\textsuperscript{6}, David Joseph\textsuperscript{1,4,5} and Daniel A Galvão\textsuperscript{1}
PREVENTING ADT TOXICITY – CURRENT TRIAL
PROSTATE CANCER TREATMENT

- Erectile dysfunction
- Loss of libido
- Penile shortening
- Altered orgasm experience
- Reduced/absent ejaculation
- Testicular atrophy
- Urinary & bowel issues
- ↑ Risk of comorbid conditions (CVD, diabetes, obesity)
- Depression and anxiety

- Body feminization (↓ muscle mass, female pattern weight gain, hot flashes, gynecomastia, ↓ body hair)
- Fatigue
- ↓ Physical fitness
- ↓ Physical activity levels
- ↓ Masculine self-esteem
- ↓ Quality of life
- Emotional lability
- Altered intimate relationship

SEXUAL DYSFUNCTION
EXERCISE & SEXUAL WELLBEING

OPINION

Exercise therapy for sexual dysfunction after prostate cancer

Prue Cormie, Robert U. Newton, Dennis R. Taaffe, Nigel Spry and Daniel A. Galvão

EXERCISE

- Positive body composition changes (↑ muscle mass and ↓ fat mass)
- ↓ Fatigue
- ↓ Risk of co-morbid conditions (CVD, diabetes, obesity)
- ↓ Depression and anxiety

↑ Physical fitness (muscle strength, aerobic capacity, function)
- ↑ Physical activity level
- ↑ Masculine self-esteem
- ↑ Quality of life

IMPROVED SEXUAL HEALTH

EXERCISE & SEXUAL WELLBEING

Original Article
Exercise maintains sexual activity in men undergoing androgen suppression for prostate cancer: a randomized controlled trial

P Cormie¹, RU Newton¹,², DR Taaffe¹,³, N Spry¹,⁴,⁵, D Joseph¹,⁴,⁶, M Akhll Hamid⁷ and DA Galvão¹

<table>
<thead>
<tr>
<th>Treatment</th>
<th>ADT (previously: 37% radiation, 40% surgery)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>RCT (Exercise vs. Usual Care)</td>
</tr>
<tr>
<td>Sample</td>
<td>57 (age = 69.5 ± 7.3 years)</td>
</tr>
<tr>
<td>Intervention</td>
<td>3 months; group-based; AEP supervised</td>
</tr>
<tr>
<td>Protocol</td>
<td>Resistance &amp; aerobic exercise (2 x weekly)</td>
</tr>
<tr>
<td>Primary endpoint</td>
<td>Sexual activity (EORTC QLQ-PR25)</td>
</tr>
</tbody>
</table>

Cormie et al. Prostate Cancer Prostatic Disease 2013
EXERCISE & SEXUAL WELLBEING

- Exercise maintained sexual activity
- Driven by changes in libido
- Related to change in quality of life ($p \leq 0.030$)

Cormie et al. Prostate Cancer Prostatic Disease 2013
# EXERCISE & SEXUAL WELLBEING

Sexuality and exercise in men undergoing androgen deprivation therapy for prostate cancer

K. Hamilton · S. K. Chambers · M. Legg · J. L. Oliffe · P. Cormie

<table>
<thead>
<tr>
<th>Treatment</th>
<th>ADT (previously: 83% radiation, 11% surgery)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Descriptive, qualitative design</td>
</tr>
<tr>
<td>Sample</td>
<td>18 men (age = 61.7 ± 5.4 years)</td>
</tr>
<tr>
<td>Intervention</td>
<td>4.3 ± 2.4 months; group-based; AEP supervised</td>
</tr>
<tr>
<td>Protocol</td>
<td>Resistance &amp; aerobic exercise (2 x weekly)</td>
</tr>
<tr>
<td>Outcome Measures</td>
<td>Thematic content analysis</td>
</tr>
</tbody>
</table>

Hamilton et al. Supportive Care Cancer 2014
EXERCISE & SEXUAL WELLBEING

- Improved Body Image
- Improved Energy
- Improved Mood
- Engage in & Master a Masculine Activity
- Sense of Control

Structured Exercise
Reinforcement of Masculinity

Improved Sexual Wellbeing

Hamilton et al. Supportive Care Cancer 2014
Improving sexual health in men with prostate cancer: randomised controlled trial of exercise and psychosexual therapies

Prue Cormie\textsuperscript{1*}, Suzanne K Chambers\textsuperscript{1,2,3,4,6}, Robert U Newton\textsuperscript{1}, Robert A Gardiner\textsuperscript{1,5,6}, Nigel Spry\textsuperscript{1,7,8}, Dennis R Taaffe\textsuperscript{1,9}, David Joseph\textsuperscript{1,7,8}, M Akhllil Hamid\textsuperscript{1,10}, Peter Chong\textsuperscript{11}, David Hughes\textsuperscript{12}, Kyra Hamilton\textsuperscript{2} and Daniel A Galvão\textsuperscript{1}
SEXUAL WELLBEING – CURRENT TRIAL

OPTIMAL MANAGEMENT OF SEXUAL DYSFUNCTION

PHARMACOLOGICAL INTERVENTION

- Penile rehabilitation & other therapy to address:
  - Erectile dysfunction
  - Loss of libido
  - Penile shortening
  - Altered orgasm experience
  - Reduced/absent ejaculation
  - Testicular atrophy
  - Incontinence
  - Hot flashes
  - Gynecomastia

EXERCISE INTERVENTION

- Aerobic & resistance exercise to address:
  - Body feminisation (↓ muscle mass, female pattern weight gain)
  - Fatigue
  - Risk of co-morbid conditions (CVD, diabetes)
  - ↓ Physical fitness and physical activity levels
  - Depression
  - Anxiety
  - ↓ Quality of life
  - ↓ Masculine self-esteem
  - ↓ Libido

PSYCHOLOGICAL INTERVENTION

- Psycho-oncologic & sexual counselling to address:
  - Altered intimate relationships
  - Depression
  - Anxiety
  - Emotional lability
  - ↓ Quality of life

### EXERCISE & ADVANCED DISEASE

#### ORIGINAL ARTICLE

Safety and efficacy of resistance exercise in prostate cancer patients with bone metastases

Cormie et al. Prostate Cancer Prostatic Disease 2013

<table>
<thead>
<tr>
<th>Treatment</th>
<th>ADT (previously: 55% radiation, 20% surgery)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>RCT (Resistance Exercise vs. Usual Care)</td>
</tr>
<tr>
<td>Sample</td>
<td>20 men (age = 72.2 ± 7.2 years)</td>
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<tr>
<td>Intervention</td>
<td>3 months; group-based; AEP supervised</td>
</tr>
<tr>
<td>Protocol</td>
<td>Modular resistance exercise; 2 x week</td>
</tr>
<tr>
<td>Primary endpoint</td>
<td>Physical function</td>
</tr>
</tbody>
</table>
EXERCISE & ADVANCED DISEASE

ORIGINAL ARTICLE

Safety and efficacy of resistance exercise in prostate cancer patients with bone metastases

P Cormie\textsuperscript{1}, RU Newton\textsuperscript{1}, N Spry\textsuperscript{1,2,3}, D Joseph\textsuperscript{1,2,3}, DR Taaffe \textsuperscript{1,4} and DA Galvão\textsuperscript{1}

<table>
<thead>
<tr>
<th>Metastases site</th>
<th>Body region to target</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upper body</td>
</tr>
<tr>
<td>Pelvis</td>
<td>✓</td>
</tr>
<tr>
<td>Lumbar spine</td>
<td>✓</td>
</tr>
<tr>
<td>Thoracic spine and/or ribs</td>
<td>✓\textsuperscript{a}</td>
</tr>
<tr>
<td>Femur</td>
<td>✓</td>
</tr>
<tr>
<td>All regions</td>
<td>✓\textsuperscript{a}</td>
</tr>
</tbody>
</table>

✓ = Target exercise region.
\textsuperscript{a}Exclusion of shoulder flexion/extension/abduction/adduction; inclusion of elbow flexion/extension.
\textsuperscript{b}Exclusion of hip extension/flexion; inclusion of knee extension/flexion.

Cormie et al. Prostate Cancer Prostatic Disease 2013
## EXERCISE & ADVANCED DISEASE

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse events during the exercise sessions</td>
<td>0</td>
</tr>
<tr>
<td>Attendance (out of 24 sessions)</td>
<td>20.2 ± 7.6</td>
</tr>
<tr>
<td>Compliance (% of successfully completed sessions)</td>
<td>93.2 ± 6.3</td>
</tr>
<tr>
<td>Perceived tolerance of the exercise sessions</td>
<td>6.1 ± 0.7</td>
</tr>
<tr>
<td>(0 = intolerable; 7 = highly tolerable)</td>
<td></td>
</tr>
<tr>
<td>Perceived exercise intensity (session RPE)</td>
<td>13.8 ± 1.5</td>
</tr>
<tr>
<td>Severity of bone pain at the start of each session (average of all sessions; 0 = no pain; 10 = very severe pain)</td>
<td>0.6 ± 0.7</td>
</tr>
<tr>
<td>Incidence of bone pain negatively affecting the ability to undertake ADL between exercise sessions</td>
<td>0</td>
</tr>
</tbody>
</table>

- No change in use of pain medication throughout 3 months
EXERCISE & ADVANCED DISEASE

Adjusted Group Difference in Mean Change Over 12 weeks*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent Difference (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone Pain</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>Muscle Strength</td>
<td>0.010</td>
<td></td>
</tr>
<tr>
<td>Aerobic Fitness</td>
<td>&lt; 0.001</td>
<td></td>
</tr>
<tr>
<td>Ambulation</td>
<td>0.026</td>
<td></td>
</tr>
<tr>
<td>Lean Mass</td>
<td>0.003</td>
<td></td>
</tr>
</tbody>
</table>

Favours Exercise

1.7 kg

*Between group change by ANCOVA adjusted for baseline values; *aIncludes adjustment for use of pain medication

Cormie et al. Prostate Cancer Prostatic Disease 2013
Efficacy and safety of a modular multi-modal exercise program in prostate cancer patients with bone metastases: a randomized controlled trial

Daniel A Galvão¹, Dennis R Taaffe², Prue Cormie¹, Nigel Spry³,⁴, Suzanne K Chambers⁵,⁶, Carolyn Peddle-McIntyre¹, Michael Baker¹, James Denham⁷,⁸, David Joseph³,⁴, Geoff Groom⁹ and Robert U Newton¹
SUPervised VS. PA RECOMMENDATION

A Multicentre Year-long Randomised Controlled Trial of Exercise Training Targeting Physical Functioning in Men with Prostate Cancer Previously Treated with Androgen Suppression and Radiation from TROG 03.04 RADAR


<table>
<thead>
<tr>
<th>Treatment</th>
<th>Previous ADT &amp; RT (5.6 ± 2 years post diagnosis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>RCT (Exercise vs. Physical activity education)</td>
</tr>
<tr>
<td>Sample</td>
<td>100 men (age = 71.7 ± 6.4 years)</td>
</tr>
<tr>
<td>Intervention</td>
<td>12 months (6 months of group-based, AEP supervised)</td>
</tr>
<tr>
<td>Protocol</td>
<td>1) Resistance &amp; aerobic exercise (6 months supervised + 6 months home based) vs. 2) Printed physical activity education material</td>
</tr>
<tr>
<td>Outcome Measures</td>
<td>Cardiorespiratory fitness (400 m walk)</td>
</tr>
</tbody>
</table>
SUPERVISED VS. PA RECOMMENDATION

Group Difference in Mean Change Over 12 months

Exercise > PA Recommendation

6m p < 0.001
12m p = 0.011

6m p = 0.029
12m p = 0.028

6m p = 0.006
12m p = 0.002

6m p = 0.025
12m p = 0.649

6m p < 0.001
12m p = 0.755

Galvão et al. European Urology 2014
PATIENT EXPERIENCE OF EXERCISE

A Qualitative Exploration of the Experiences of Men With Prostate Cancer Involved In Supervised Exercise Programs

Prue Cormie PhD, Brooke Turner MPych, Elizabeth Kaczmarek PhD, Deirdre Drake PhD and Suzanne K. Chambers RN, PhD

<table>
<thead>
<tr>
<th><strong>Treatment</strong></th>
<th>ADT (previously: 100% RT, 25% PT)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td>Descriptive, qualitative design</td>
</tr>
<tr>
<td><strong>Sample</strong></td>
<td>12 men (age = 75.3 ± 4.5 years)</td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td>6.0 ± 3.1 months; group-based; AEP supervised</td>
</tr>
<tr>
<td><strong>Protocol</strong></td>
<td>Resistance &amp; aerobic exercise (2 x weekly)</td>
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<td><strong>Outcome Measures</strong></td>
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PATIENT EXPERIENCE OF EXERCISE

A Qualitative Exploration of the Experiences of Men With Prostate Cancer Involved In Supervised Exercise Programs

Prue Cormie PhD, Brooke Turner MPych, Elizabeth Kaczmarek PhD, Deirdre Drake PhD and Suzanne K. Chambers RN, PhD

Supervised Group Based Exercise Program for Men with Prostate Cancer

Health Benefits
- Physical Wellbeing
- Mental Wellbeing

Support from the Exercise Physiologist
- Educational Resource
- Support Provider
- Shared Experience of Prostate Cancer
- Developing Social Connections

Peer Support

Cormie et al. Oncology Nursing Forum 2014
EXERCISE & PSYCHOSOCIAL WELLBEING

A support group tailored for men:

- Activity based
- Casual environment
- Positive atmosphere
- Humour
- Facilitated by an allied health professional
- Extends social networks
EXERCISE & PSYCHOSOCIAL WELLBEING

Acute Care: Intensive or comprehensive therapy for acute and complex psychological problems

Specialist Care: Specialised therapy for depression, anxiety, relationship or marital distress

Low Intensity Care: Cognitive behavioural intervention, stress management, coping skills training, psychoeducation, decision support

Universal Care: Patient education, emotional support, practical assistance, peer support, physical activity and exercise, distress screening and referral

Supervised Prostate Cancer Specific Group Based Exercise Program

Chambers et al. PCFA & Griffith Uni 2013
EXERCISE IS MEDICINE

On present knowledge, exercise offers the greatest potential as an adjunct therapy to reverse treatment related side-effects and increase the quality & potentially quantity of life in men with prostate cancer.
RESEARCH TEAM

Robert Newton (ECU)
Daniel Galvão (ECU)
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Nigel Spry (SCGH, ECU)
David Joseph (SCGH, ECU)
Suzanne Chambers (GU, ECU)
Dennis Taaffe (UWoll, ECU)
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Courtney Ishiguchi
Kelly Vibert
THANK YOU

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