“Eating alone will not keep a man well; he must also take exercise. For food and exercise, while possessing opposite qualities, yet work together to produce health.”

- Hippocrates, Regimen, 5th Century B.C.

23 and 1/2 hours: What is the single best thing we can do for our health?

http://youtu.be/aUaInS6HlGo
“Exercise is the closest thing we’ll ever get to the miracle pill that everyone is seeking.”

Barriers to exercise amongst prostate cancer survivors¹
1. Too busy – 45%
2. No willpower – 44%

Concern about over-exertion and type of exercise considering severity of treatment
Perceived barriers:
   Parking, increased visits to the hospital, transportation, distance and location.

Androgen-deprivation therapy (ADT)

- Side effects may include:
  - ↓ lean muscle mass (sarcopenia)
    - ↓ muscle strength
    - ↓ physical functionality
    - ↓ independence
  - Osteoporosis (bone density changes)
    - ↑ risk of fracture
  - Cardiovascular and metabolic disease risk
  - Weight (fat) gain
  - Joint pain
  - ↓ balance
  - ↓ Quality of Life
- Exercise with treatment
- Exercise pre-treatment
Exercise in treatment

- Exercise can reverse many side-effects\(^1\)
  - ↓ fatigue
  - ↑ QOL
  - ↑ muscle strength and endurance
  - ↑ functional performance
  - ↑ balance

## Exercise Benefits

- **Summary of potential benefits of exercise during and/or following cancer treatment**

<table>
<thead>
<tr>
<th>Preservation or improvements</th>
<th>Reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle mass, strength, power</td>
<td># symptoms/side-effects (nausea, fatigue, pain)</td>
</tr>
<tr>
<td>Cardiorespiratory fitness</td>
<td>Intensity of symptoms reported</td>
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<tr>
<td>Physical function</td>
<td>Duration of hospitalisation</td>
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<td>Physical activity levels</td>
<td>Psychological land emotional stress</td>
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<tr>
<td>Range of motion</td>
<td>Depression and anxiety</td>
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<tr>
<td>Immune function</td>
<td></td>
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<tr>
<td>Chemotherapy completion rates</td>
<td></td>
</tr>
<tr>
<td>Body image, self esteem and mood</td>
<td></td>
</tr>
</tbody>
</table>

Exercise and tumour growth

- Serum from exercised mice
- Human mammary cancer cell line (MCF-7)

And spread (metastasis)

Potential concerns

- **Exercise outcomes**
  - Age doesn't matter
  - Not influenced by ADT

- I’ve been on ADT for a long-time
  - No difference in exercise response if ADT > or < 6 months

- Is it safe?
  - “…exercise training and maximal and submaximal exercise testing are relatively safe procedures… [for cancer populations]”
  - Discuss with exercise professional – “The Man Plan”

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Exercise - Considerations

- Resistance or Aerobic?
- No real difference\(^1\), likely to depend more on individual needs
- Most evidence relates to:
  - higher intensity > lower intensity > no intensity

- Take into consideration\(^2\)
  - Stage (diagnosis)
  - Site
  - Treatment(s)
  - Symptoms (fatigue and nausea can be common)
  - and other health indices (co-morbidities, common include diabetes/CV risk factors)

Exercise recommendations

- Research supported positive results generally programs that are:
  - At least 2 x week for min. 12 weeks
  - Best: Every-day – resistance 3-4/week

- Aerobic exercise
  - 15-20 min cycling and walking/jogging*

  * Impact may be superior

- Strength exercise
  - 2-4 x 12-6 Rep Max**
  - Machine weights:
    - Chest press, seated row, shoulder press, tricep extension, leg press, leg extension and leg curl (and core work)

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And Diet?

- **Muscle and Strength**
  - **Timing**
    - Max protein synthesis (muscle gain) when 20g protein consumed asap after resistance exercise
  - Leucine may be particularly good
  - Omega-3 fatty acids good for preventing muscle loss in older adults
  - Meeting energy requirements (may be hard with some treatments)

- **Fat**
  - Low-fat diets...

- **Antioxidants**
  - Nine serves per day

Foods

- Grains, animal products – Sustagen/Milo useful
- Most proteins (soy best)
- Fish products, often supplemented
- Colour fruits & vegetables

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And Diet?

- Bone health
  - Calcium important

- Carcinogens?
  - Avoid burnt meats

Foods

- Dairy and non-dairy (fortified foods)
Exercise pre-treatment?

- Better outcomes if fit/healthy pre-treatment

  "Strength previously obtained is easier to regain!"

- Exercise/dietary recommendations similar to post-treatment
Resources

- Exercise is Medicine
  
  www.exerciseismedicine.org.au

- Prostate cancer specific resource:
  
  Prostate-cancer_full.pdf