Exercise Guidelines for Cancer Patients

St Vincent's Physiotherapy Tumour Forum 2013

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Role of Exercise

1. **Prevention**
   - ↓ incidence (Breast, Colon, Kidney, Prostate)
2. **During Treatment**
   - ↓ levels of fatigue, anxiety & depression
   - ↑ physical functioning & QOL scores
3. **Recovery Process**
   - Improve recovery times
   - Facilitates a healthy and active lifestyle
   - ↓ recurrence (Breast / GI)

1. Prevention

Factor	Colo	Breast	Pros	Lung	Eso	Stom	Pan	Bladder	Endom
Increasing vegetable and fruit intake	A2	A3	A3	A2	A2	A2	A3	A3	A3
Limiting intake of red meat	A2	B	A3	B	B	C	A3	C	B
Increasing physical activity	**A1**	**A1**	B	B	B	B	B	B	**A2**
Avoiding overweight	**A1**	**A1**	C	B	**A2**	C	**A3**	C	**A1**
Limiting alcohol intake	A3	A2	C	B	A1	C	A3	C	B
Consuming soy foods	B	B	B	B	B	B	B	2B	B

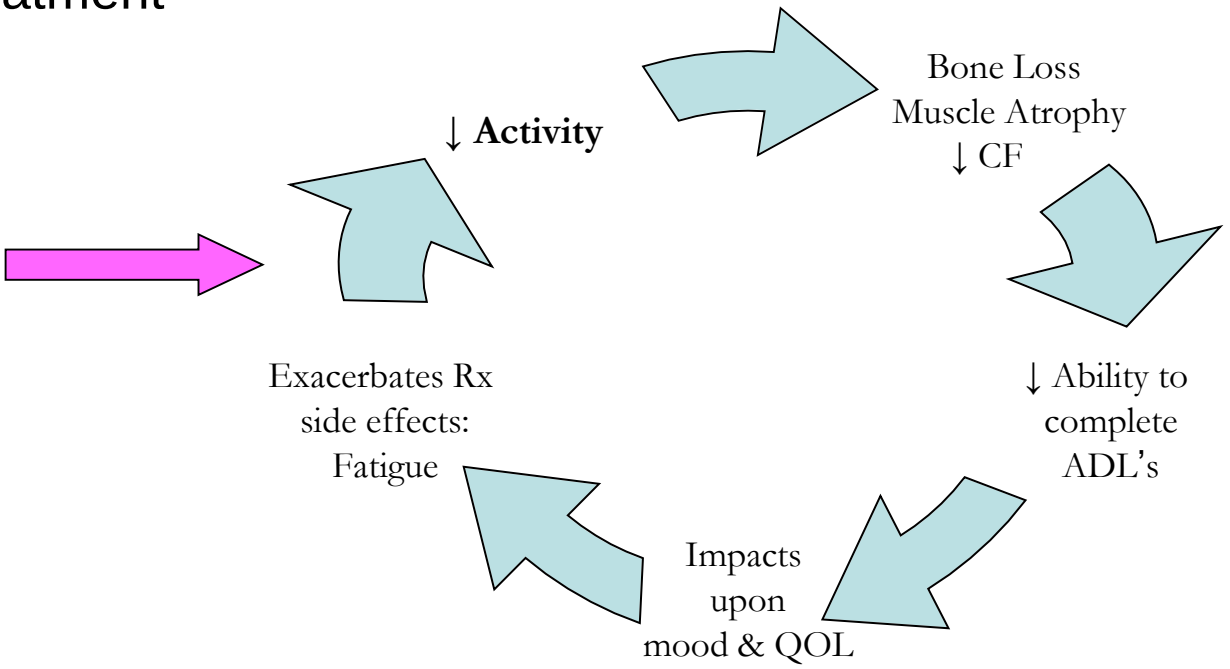
American Cancer Society Guideline on Nutrition and Physical Activity for Cancer prevention (2008)

2. During treatment

Impaired fitness:

- Pt's significantly ↓ physical activity levels between diagnosis and starting active treatment

THE DECONDITIONING PROCESS



Decreased activity levels in AYA's

n= 74 AYA's survivors 15-25 years of age

Mean minutes per week current activity levels changes from diagnosis p=<0.001

Murnane et al 2013, JCO submitted (2013)

3. Recovery Process

- Observational studies – participation in moderate intensity exercise after diagnosis is associated with improved survival.
  - *Breast*: **24-67%** reduction in the risk of total deaths and **50-53%** reduction in breast cancer deaths[1]
  - *Colon*: 3 hr week of moderate intensity exercise is associated with; **39-59%** reduction in the risk of colon cancer death and **50-63%** reduction in the risk of total deaths[1]
- Survivors are at increased risk of co-morbidities / chronic disease that can be reduced through increased physical activity
  - Cardiovascular disease
  - Diabetes
  - Osteoporosis

[1] Rock 2012

Impaired levels of cardiorespiratory fitness

Impaired fitness in Breast cancer patients: (*Jones, JCO 2012)*

- Using CPX testing
- Breast cancer pt's cardiorespiratory fitness post treatment is 32% below Healthy Sedentary Women (n=247)
- Therefore patients who are 50 years of age post treatment have the same fitness of a Sedentary 70 year old women
- Also seen in other cancer groups

  -Early NSCLC 36%,

  -Advanced stage NSCLC 33%,

  -Brain 32%,

  -Prostate 22%

Why is this important?

Exercise and Mortality

- Metastatic Breast cancer pts (n=52) (*Jones, JCO, 2012*)

  - pt's with higher fitness survival time = 36months vs. 16months

- Operable NSCLC (n=398) *(Jones, Cancer, 2010)*
  - V02 < 14 = median survival 30.5 months and 5 year survival 30% compared to
  - V02 >14 = median survival = 42.7 months and 5 year survival 36%

- Recurrent Glinoma (n=243) *(Ruden, J Clin Oncol, 2011)*
  - pt's participating in regular brisk exercise (5X per week for 30 mins) = median 21.84 months survival vs. 13.03 months for sedentary pt's

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Position stand

Australian Association for Exercise and Sport Science position st[and]: Optimising cancer outcom[es t]hrough exercise

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The Cancer Rehabilitation Journey: Barriers to and Facilitators of Exercise Among Patients With Cancer-Related Fatigue

SPECIAL COMMUNICATIONS
Roundtable Consensus Statement

American College of Sports Medicine Roundtable on Exercise Guidelines for Cancer Survivors

EXPERT PANEL
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Peter Mac

Physiological outcomes from exercise in cancer patients

Exercise modality	Cancer relevant expected outcome
Cardiovascular exercise	↑ Cardiopulmonary function, ↑ insulin sensitivity*, ↑FP, ↑ HDL*, ↓ LDL*, ↓fat mass, ↓fatigue.
Anabolic exercise / resistance exercise	↑ Muscle mass*, ↑ muscle strength, ↑ muscle endurance, ↑ muscle power*, ↑ BMD, ↑ FP, ↑ metabolic rate*, ↓fatigue, ↓ fat mass*.
Flexibility exercise	↑↔ Range of Motion

* Data not available within the cancer population, recommendations based from studies undertaken within the non-cancer population.

Exercise Prescription

	Aerobic Exercise	Resistance Exercise
Mode	Walking (outdoor or treadmill) Stationery cycling	Focus on exercises that target the main muscle groups, for example; Bench press, shoulder press, row, bicep curl, lat pull-down, squats, heel raises, step ups.
Frequency	3-5 times per week	2-3 times per week (min of 1 day rest b/w sessions)
Intensity	Moderate intensity: 50-75% VO2 max 50-80% HR max 40-70% HR reserve RPE 11-14	50-80% 1-RM 6-12 RM
Duration	20-45 minutes; continuous or intermittent Longer than 60min may induce fatigue. 30 mins is highly recommended.	1-3 sets 8-15 reps
Progression	Patients must first aim to meet frequency and duration goals before intensity is increased. De-conditioned pts will require a slower and more gradual progression ie: 3-5mins of activity several times per day at 50% of HR max.	Initial progression should be in the number of reps per set (2X15). Once this is achieved the number of sets can be increased (3X10-3X15). Following the increase in sets, weight can be added to further resistance.

Contraindications: cancer specific

	Normal Values	Restricted Ex	Light Ex	Normal Ex	Comment
Hematocrit: Females Males	 37-47% 40-50%	<25%	>25%	>35%	
Hemoglobin: Females Males	 12-16 g/dl 14-18 g/dl	<8g/dl	8-10 g/dl	>10 g/dl	Low Hb levels; avoid activities that require significant oxygen transportation
White Blood Cells	4,000-10,000/mm3	<500/mm3	>500/mm3	>500/mm3	Low Neutrophil count; avoid activities that ↑ the risk of infection eg swimming, high intensity exercise.
Platelets	200,000-400,000/mm3	<5,000/mm3	5,000-10,000/mm3	>10,000/mm3	↓ Platelets: avoid activities that ↑ the risk of bleeding (weight lifting / contact sports)
Body Temp	35.5-37.7ºC	>38ºC (Fever)			May indicate systemic infection and requires further investigation. Avoid high intensity exercise.

Cancer specific precautions to exercise

- Cachexia (loss of >35%)
- Bone pain or compromised skeletal activity (bony mets)
- Compromised immune function
- Fatigue
- Skin changes post RT
- Peripheral neuropathies or ataxia
- Swimming
- Exercise intensity determined by HR may be difficult
- Medical clearance

Barriers to Rehab in Sarcoma pt's

- Complex multimodal management impacting on functional capacity[1]
- Prolonged treatments – chemo / RT with LSS or Amputation
- Significant and enduring physical, social and psychological impacts[2]
- Limited research which examines functional capacity and health related QOL across the treatment trajectory & detailed rehabilitation programs[3]
- Many challenges – choice of surgical procedure & medical complications
- Lack of functional outcome measures
- Similar finding b/w LSS & Amputation in QOL & functional outcomes – differences in various subscales

[1] Stiller et al 2006
[2] Bekering et al 2012
[3] Eiser 2009

Rehab goals and Outcome measures

- Interventions should be individualised
  - Ax of medical limitations
  - Functional goals & expectations
  - Modification of environment

- Rehab Ax

1. Phys Function (ROM, Strength, Gait)
2. Impaired ex capacity
3. Fatigue
4. Psychosocial Considerations
5. Pt Goals
6. Treatment

Category	Measures	Detail
Physical Function	6- minute walk test	Measures functional ambulation and cardiorespiratory fitness
	Timed Up & Go (TUG)	Observes functional mobility in patients
	Limb Strength & Joint ROM	via isokinetic dynamometer
	High Level Mobility Score (HiMAT)	Assesses uni-dimensional function through various physical tests
	Toronto Extremity Salvage Score (TESS	A self administered questionnaire specific to limb salvage patients to measures physical function and describes change over time (post surgery)
	Musculoskeletal Tumour Society (MSTS)	Clinician perception of pt's level of function
	Timed 'up and down stairs" (TUDS	More difficult for patients with greater disability and those requiring walking pages
Psychosocial	Short Form 36 (SF-6)	Measures physical functioning, social functioning, mental functioning and other health dimensions (including fatigue)
	Hospital Anxiety and Depression Scale (HADS)	An instrument which detects the presence and severity of mild degrees of mood disorder, anxiety and depression
	Assessment of Quality of Life-6D (AQoL-6D)	A validated QoL tool within AYA population
	Reintegration to Normal Living Index (RNL)	The degree to which individuals who have experienced traumatic or incapacitating illness achieve re-integration into normal social activities
	Memorial Symptom Assessment Scale (MSAS)	A symptom prevalence scale

Background

- 24 year old male, Osteosacroma R proximal femur (Dx 2011)
- Completed neo adj chemo, surgery (mega prosthetic recon) & post-op chemo
- 1 month post treatment completion
- Lives with supportive parents
- Studying Arts at RMIT
- Pt LOW 6 kgs during Rx / ↓Muscle mass
- Previously very active
- Fixed flexion deformity & ↓R hip ext & abd

Patient Ax and Goals

- ↓CR fitness (6MWD pre 753m v's 312m)
- Impaired gait (TUG) – Using 1 X EC
- ↓ UL and LL strength
- R LL weakness (HDD)
- Improve general fitness
- Bike
- UNI

Phase 1: Week 1-6

- 2 x S/V sessions & 1 Physio & 2 HEP
- Ex Routine, UL Strength
- Aerobic 4X/week: 15-20 minutes ex bike
- Strength ex's 2X/week; major muscle groups UL 2X10-15 with (2-3kg DB)

Phase 2: Week 7-12

- 1 S/V session & bi-mth Physio & 2 HEP
- Build independence, LL strength
- Aerobic 4X/week: 20-30 minutes ex bike
- Strength ex's 2X/week; major muscle groups UL 2-3X10-15 with (3-5kg DB)

Phase 3: >12 weeks

- 4-5 X HEP with 6 month review
- Provide pt with tools & skills to be self sufficient
- Aerobic 4X/week: >30 minutes ex bike & road
- Strength ex's 2X/week; major muscle groups UL 2-3 X12-15 with (5-10kg DB)

	Baseline	8 weeks	6 months	change
BMI	20.42	21.52	21.18	+0.76
Girth (cms) *Bicep* *Calf*	 25 35	 27 38	 28 40	 +3cms +5cms
STS	7	11	17	+10
Push-up	12	17	24	+12
Grip Strength	R=32 / L=30	R=34 /L=32	R=37/L=35	R+5 / L+5
Bicep Curl	R=18 / L=18	R & L=23	R & L=26	+8
HHD: Sh Abd Knee ext D/flexion	 R=14.5 / L=19 R=9 / L=15 R=14.5 / L=21.5	 R&L =21.5 R=18/ L=28.5 R=26 / L=28	 R=24 / L=23 R=22 / L29 R&L =28	 R+9.5 /L+4 R+13 / L+13.5 R+13.5 / L+6.5
TUG	13.81	8.84	5.81	- 8 seconds
6MWT	312	423	579	+267m

SF-36: 7 point improvement in Physical Component scale and 4 point improvement on Mental Component Scale over 6 months

Exercise options for patients

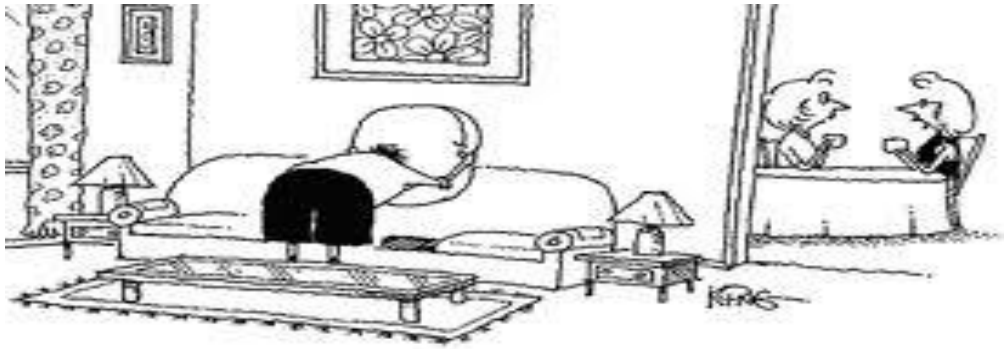
- Oncology based rehab programs
  - Eastern Health
  - St John of God (Nepean, Ballarat)
  - Vic Rehab Centre
  - Peninsula Health

- Medicare Benefits Schedule (MBS) – chronic disease individual allied health services
  - 5 services per patient per year

- Private Insurance

Summary

- Good evidence that cancer patients can be active pre Rx, during Rx and post Rx.
  - Alleviates treatment side effects
  - ↑ Physical and Psychological outcomes
  - Pt's who have advanced signs of de-conditioning may benefit the most from exercise
  - Strategies are needed ↑ Physical Activity at all time-points



The doctor said he needed more activity. So I hide his T.V. remote three times a week.