

Cancer Rehabilitation- update on our progress & how to fight Cancer related fatigue and exercise despite bony mets

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Faculty/Presenter Disclosure

- **Faculty:** Dr. Tatjana Zdravkovic, MD FRCPC
- **Relationships with commercial interests:**
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 - **Speakers Bureau/Honoraria:** None
 - **Consulting Fees:** None
 - **Other:** None



Disclosure of Commercial Support

- Potential for conflict(s) of interest: None



Mitigating Potential Bias

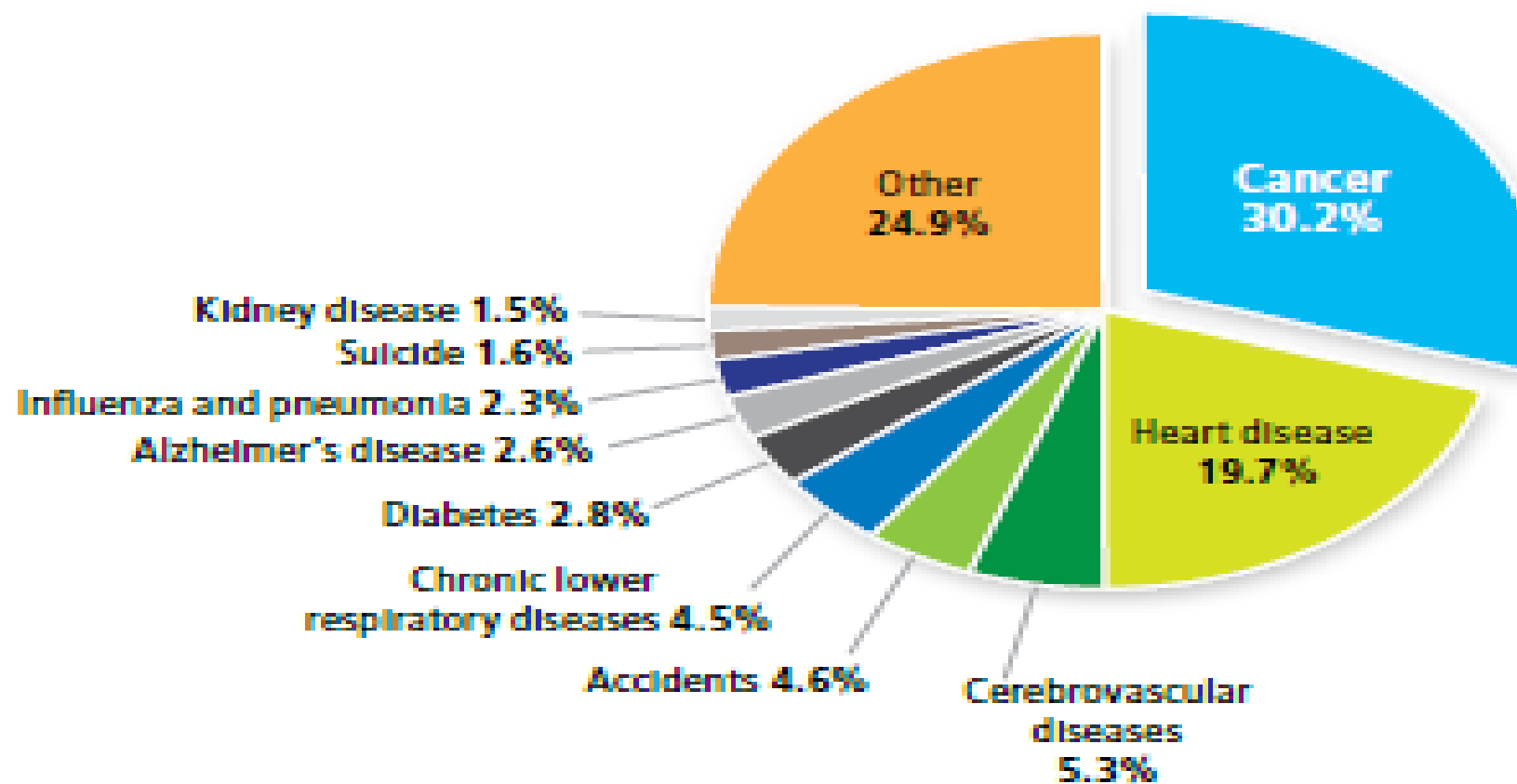


Objectives

At the end of presentation:

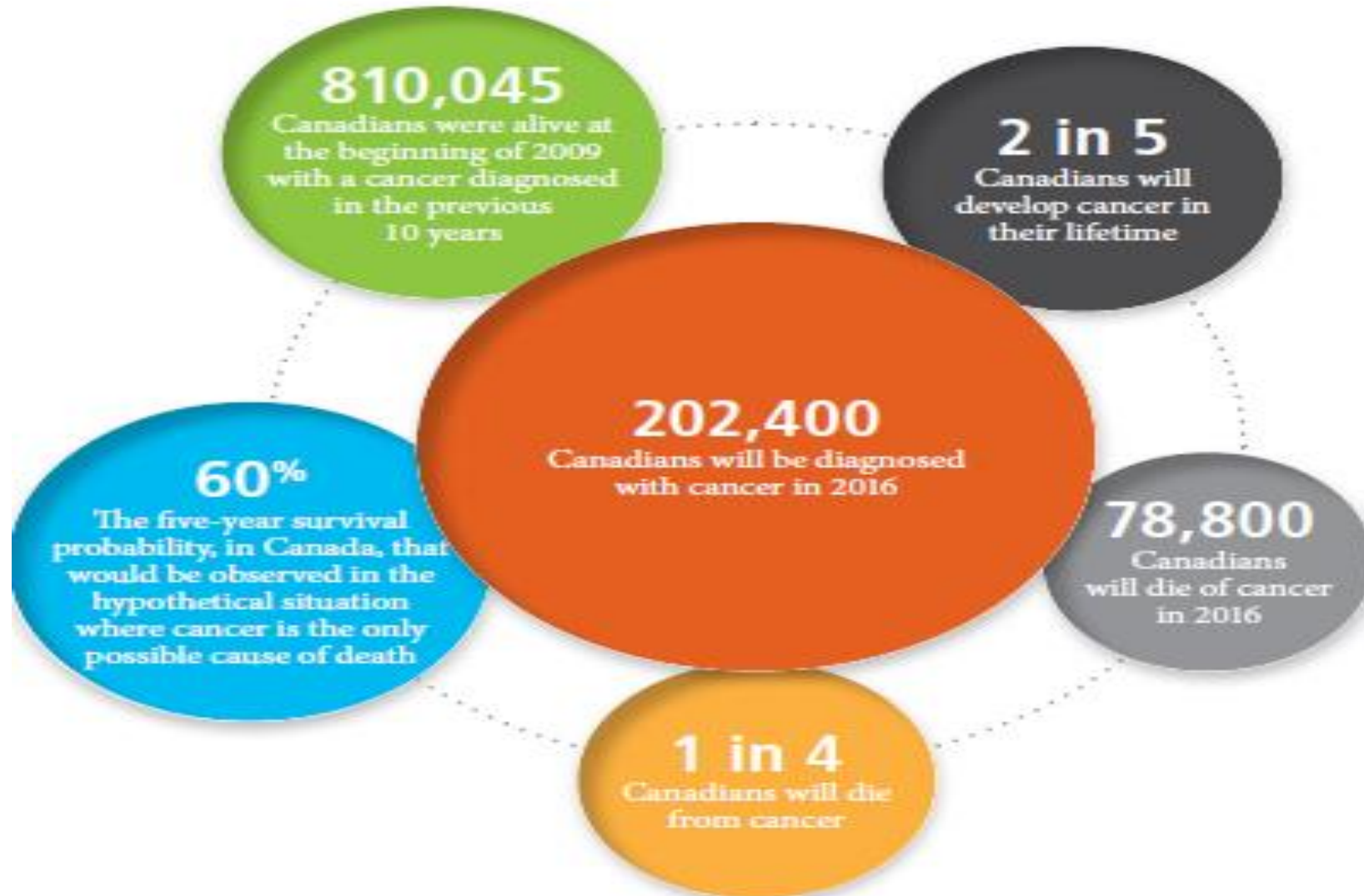
- Learners will become familiar with available Cancer Rehabilitation pathways in Niagara Region
- Learners will be aware of the current evidence how to fight Cancer related fatigue
- Learners will be aware of current recommendations related to exercise despite bony metastatic disease & how to maintain a bone health

FIGURE A Proportion of deaths due to cancer and other causes, Canada, 2012



Note: The total of all deaths in 2012 in Canada was 246,596.

Data source: Canadian Vital Statistics Death database at Statistics Canada.⁽⁹⁾



Rehabilitation

- WHO (2011):

"a set of measures that assist individuals, who experience or are likely to experience disability, to achieve and maintain optimum functioning in interaction with their environments".

What is the role of the rehabilitation in care
for the patient with cancer?

“Cancer rehabilitation is intended to achieve optimum physical, social, psychological and vocational functioning within the limits imposed by the disease and its treatment.”

Cromes 1978

Cancer Rehabilitation

- Focus on **patient-centred goals** which aim to:
 - optimize independence
 - improve quality of life
 - improve mood
 - ameliorate symptoms
 - maximize wellbeing
 - facilitate any individual remaining in their preferred place of care

Who is involved in the rehabilitation of the patients ?

The rehabilitation team

- Patient/ Family
- Psychiatrist
- Nurse
- Physiotherapist
- Occupational therapist
- Speech and language pathologist
- Social worker
- Recreational therapist
- Exercise therapist
- Psychologist
- Dietician
- Chaplain
- Community services
- Medical Oncologist
- Radiation Oncologist
- Surgeon

Rehabilitation Framework

- I. Staging/pre-treatment
- II. Primary treatment
- III After treatment
- IV. Recurrence
- V. End of life

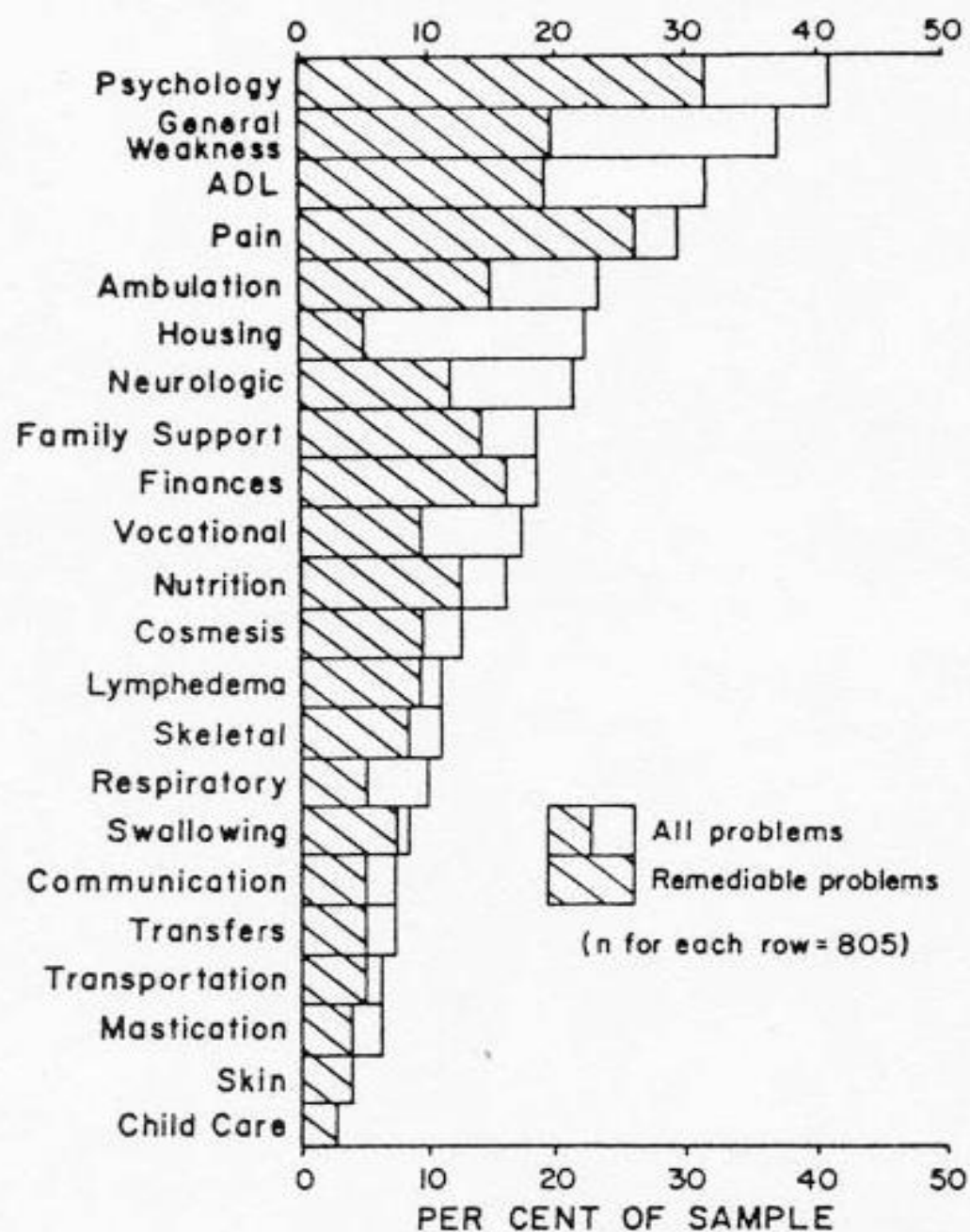
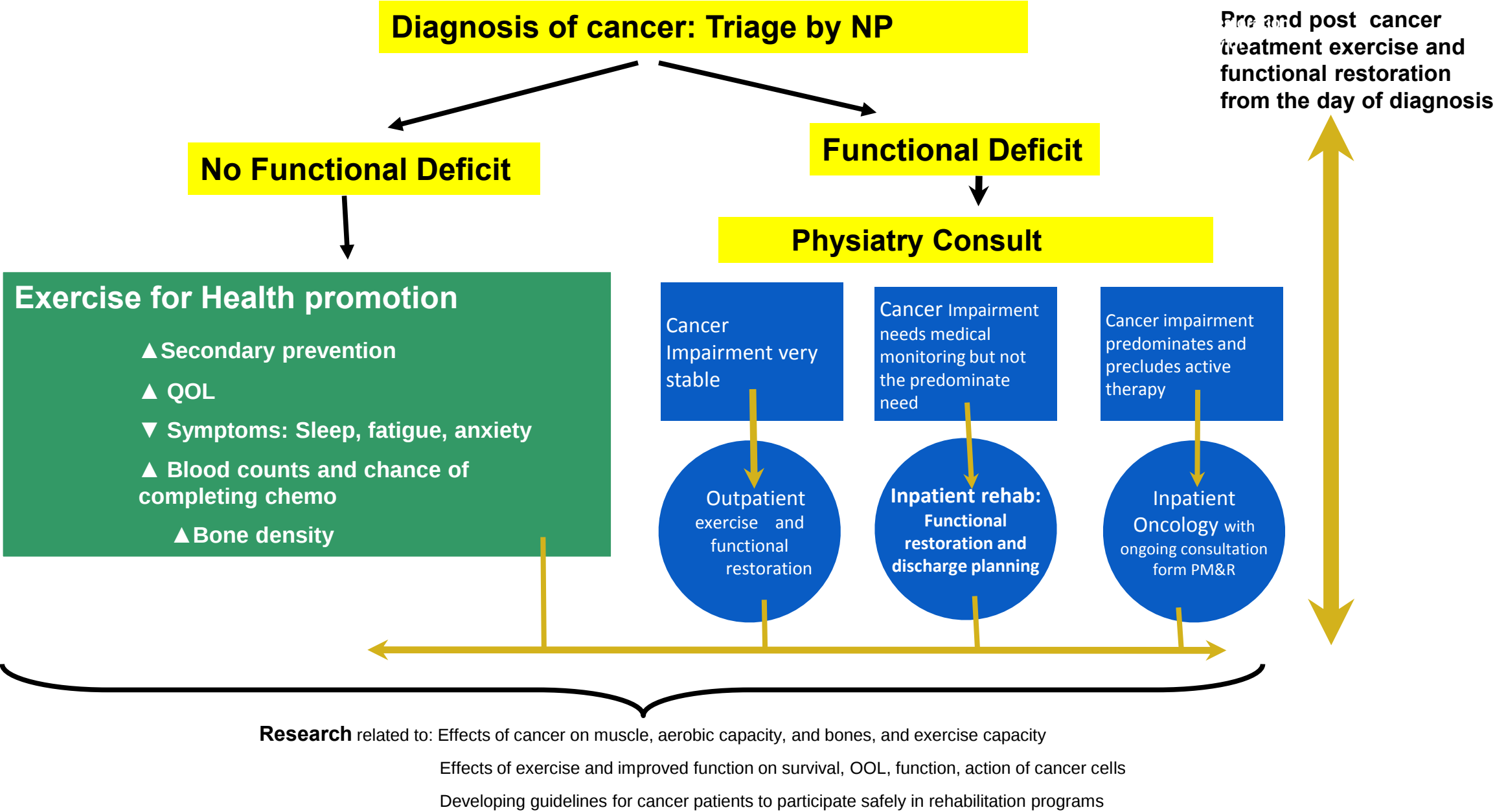


Fig 3—Percent of people in sample with one or more rehabilitation problems.

**What are we doing now and where we are going in regards
of the rehabilitation of the patients with cancer
in Our Area?**



Rehabilitation of people with Cancer: conceptual Model at McMaster University and Hamilton Health Sciences







Juravinski Hospital
and Cancer Centre



LEVEL 1

Areas of Interest

Legend

? Information Desk
A Level 1

Cafeteria
Nora's Fresh Café
E Level 0

Gift Shop
E Level 1

Atrium Café
G Level 1

Hummingbird Café
J Level 0

--- Area is on
Level 0
Washroom

Elevator
Stairs

In Patient Oncology Rehabilitation



- 4 beds
- Concurrent care Physiatrist & Oncologist
- Part of 27 bed unit- M2
- Together with MSK & deconditioned patients

Original Article

Prognostic indicators in metastatic spinal cord compression: using functional independence measure and Tokuhashi scale to optimize rehabilitation planning

V Tang^{*,1,2}, D Harvey^{2,3}, J Park Dorsay⁴, S Jiang^{2,5} and MP Rathbone^{1,2}



[Journal of Neurology](#)

June 2008, Volume 255, [Issue 6](#), pp 820–827

Rehabilitation in primary and metastatic brain tumours

Impact of functional outcomes on survival

Authors

[Authors and affiliations](#)

V. Tang, M. Rathbone, J. Park Dorsay, S. Jiang, D. Harvey 

Outpatient Oncology Rehabilitation

Wednesdays Oncology Rehabilitation Clinics by:

- Dr. D Harvey, Dr. T Zdravkovic & Jan Park-Dorsay NP

Thursdays CNS tumors Multidisciplinary Clinic:

- Radiation Oncologists: Dr. A Whitton, Dr. W McMillan, Dr. C Hann, Dr. J Greenspoon
- Medical Oncologist: H. Hirte
- Neuro-oncologist: Dr. A Torres-Trejo
- Neurologist: Dr. C Connolly
- Neurosurgeon: Dr. R DeVilliers
- Oncology Rehabilitation: Dr. T Zdravkovic

Fridays Head & Neck Tumors Multidisciplinary Clinic- in development



Name	
DOB (yy/mm/dd)	PHN
Address:	
Tel (home)	Tel (work)

Oncology Rehabilitation Clinic
“Maximizing function across the continuum of cancer care”

Phone: 905-574-8515

Fax: 905-575-2598

Date: _____

Referring provider: _____ CPSO/OHIP #: _____

Primary Care provider: _____ CPSO/OHIP #: _____

Radiation Oncologist: _____

Medical Oncologist: _____

Surgeon: _____

Oncological diagnosis: _____

Summary of Oncology treatment: _____

Reason for referral: _____

restriction: in ambulation/mobility

foot drop

restriction: in ADLs

wrist drop

restriction: in community participation

spasticity

fatigue/deconditioning

neuropathy

exercise prescription

muscle weakness

Other: _____

David T. Harvey, MD FRCPC

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Physical Medicine and Rehabilitation
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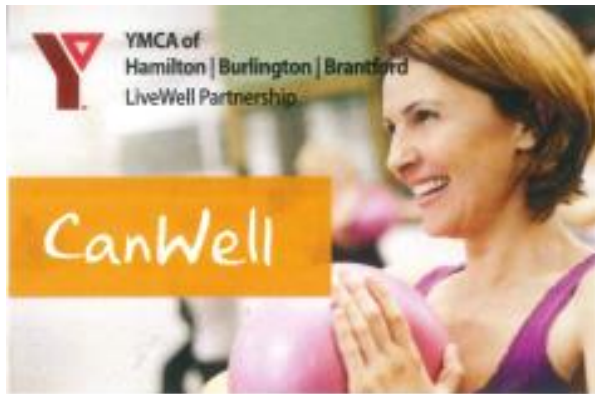
wrist drop

spasticity

neuropathy

muscle weakness

Other: _____



The YMCA of Hamilton | Burlington | Brantford, Hamilton Health Sciences and McMaster University are working together to improve community health for individuals living with cancer.

This exercise and education program is designed for adults at any stage in their cancer experience. Recent research shows that exercise can provide multiple benefits to individuals with cancer. Ongoing coaching and peer support are key elements of this program.

This is a registered program that is included in a YMCA membership. All participants will meet with a YMCA LiveWell Specialist for an intake interview to discuss medical history. Interested individuals must have written exercise clearance from a healthcare provider before participating. You may join the program at anytime.

Participants in the CanWell program can enjoy the following classes:

Group Exercise

Supervised classes where program participants have the opportunity to work on their individualized fitness plans within a group setting.

Pilates

A group fitness class that builds strength and flexibility and through the use of stabilization, alignment and breathing techniques. Promotes mental relaxation and focus.

Education Sessions

HHS health professionals and invited speakers offer practical information on living well with cancer, such as survivorship and lymphedema management.

YMCA of
Hamilton | Burlington | Brantford
LiveWell Partnership

CanWell

YMCALiveWell.ca

Program Location

Les Chater Family YMCA

356 Rymal Road East, Hamilton, ON L9B 1C2

P: 905.667.1515 | F: 905.667.5879

Please visit YMCALiveWell.ca for the current CanWell Schedule or contact the LiveWell Specialist at the Les Chater YMCA for more information.

Interested in volunteering with the program?
Please contact the Les Chater YMCA for more information and the application process.

Membership Assistance

As a charitable organization, the YMCA strives to serve all segments of the community, including those with limited financial means. Donors to the YMCA make this possible. If financial circumstances are limiting your ability to participate, assistance may be provided.

Please contact us for more information. All inquiries will be held in strict confidence.

Charitable Mission

The YMCA of Hamilton | Burlington | Brantford is a charitable organization helping people achieve personal growth in spirit, mind and body through participation and service to the community.

Our Vision

Creating healthy communities in which individuals and families have opportunities to reach their potential.

Core Values

Caring, Honesty, Respect and Responsibility.

Charitable Registration # 10868-3825-880001

[J Exerc Rehabil](#). 2015 Feb; 11(1): 20–29.

PMCID: PMC4378345

Published online 2015 Feb 28. doi: [10.12965/jer.150183](https://doi.org/10.12965/jer.150183)

Exercise facilitators and barriers following participation in a community-based exercise and education program for cancer survivors

[Oren Cheifetz](#),^{1,3,*} [Jan Park Dorsay](#),² and [Joy C. MacDermid](#)³



Wellwood

LIVING WELL ...with cancer

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HERE

to see how
we can help

**SUPPORT
YOUR
KIDS**

during your
cancer journey



WHAT'S ON THIS MONTH:

calendar of free cancer support programs

Wintery weather? We close if public schools do.

1997-2017

Celebrating
20 YEARS

OF SERVICE TO OUR COMMUNITY!



One of us got to go to
London, England, and
also got to go on the
Harry Potter studio
tour and ALL WE GOT
was this...
<https://t.co/Hq6uQesFP1>
Feb 25

TONIGHT!! Love a
guy <40 who has
cancer?
[#sendhimtoWellwood!](#)
Young men meet at
501 Sanatorium
tonight from 6-8 pm
(...
<https://t.co/oeVAFQ1uE>
Feb 22

[@liveWELLwCA](#) ...
join us this Thursday!
6-8 pm [#HamOnt](#)
[#sendhimtoWellwood](#)

<http://www.wellwood.on.ca/>

WHAT'S ON?

MARCH & APRIL
2018



FREE
CANCER SUPPORT
PROGRAMS



- Peer Support
- Exercise & Movement
- Program for Children
- Creative Expression
- Retreats & Workshops
- Meditation & Relaxation

<http://www.wellwood.on.ca/images/WHATS%20ON%20MARCH.2018.pdf>



If you, or a loved one has **cancer**,
Wellspring Niagara is here to help.



Wellspring Niagara is here to help people overcome the many emotional, social, physical and practical challenges that come with a cancer diagnosis. A community-based cancer support centre, providing FREE programs and services to men, women and children who are impacted by cancer.

Through many professionally-led programs and services, each designed to provide maximum impact for those with cancer, their families, and those who care for them, Wellspring Niagara can help you manage each step in your cancer journey.

Wellspring Niagara receives no government or hospital funding. The generosity of donors, sponsors and partners enables all Wellspring programs to be provided free of charge. We are proud to say that every dollar raised for Wellspring Niagara, stays in Niagara.

Charitable Registration #86414 6162RR0001

Find out more by visiting wellspringniagara.ca

WELLSPRING NIAGARA

3-3250 Schmon Parkway, Thorold, ON L2V 4Y6

905-684-7619



CALENDAR

Wellspring Niagara

January & February
2018

COPING SKILLS

EXPRESSIVE ARTS

FINANCIAL

HEALTH RESTORING

NUTRITION-BASED

SUPPORT

DISCUSSION SERIES

EDUCATIONAL RESOURCES



wellspring
Niagara

A Lifeline to Cancer Support

3250 Schmon Parkway, Unit 3
Thorold, ON L2V 4Y6
905-684-7619
1-888-707-1277

Please note:

We are a Scent Free environment.

If you're sick with a cold or flu, please
refrain from visiting our centre.

wellspringniagara.ca

Charitable Registration # 86414 6162 RR0001

- Energy Services
- Coping skills programs
- Financial /Workplace Programming
- Health Restoring/ Exercise
- Children &Parents Programs
- Discussion Series &Workshops
- Expressive Art Program
- Support Programs
- Bereavement Programs

Effects of the community-based Wellspring Cancer Exercise Program on functional and psychosocial outcomes in cancer survivors

D. Santa Mina PhD,*† D. Au MSc,*† J. Brunet PhD,‡ J. Jones PhD,*† G. Tomlinson PhD,*† N. Taback PhD,*
D. Field MSc,* A. Berlingeri HBA,§ H. Bradley MA,§ and D. Howell PhD*†





Outpatient **CORE** program

“Cancer Care Optimization in the Rehabilitation Environment”



How about Fatigue?

Definition

Cancer-related fatigue is a feeling of tiredness that can last a long time and does not go away with rest or sleep. It is different than fatigue you felt before you had cancer.

Fatigue is usually worse during treatment.

Your fatigue can range from mild to severe and may come and go over time.

Fatigue is the most common symptom felt by people with cancer. It is a normal part of your cancer treatment.

How to Manage Your Fatigue

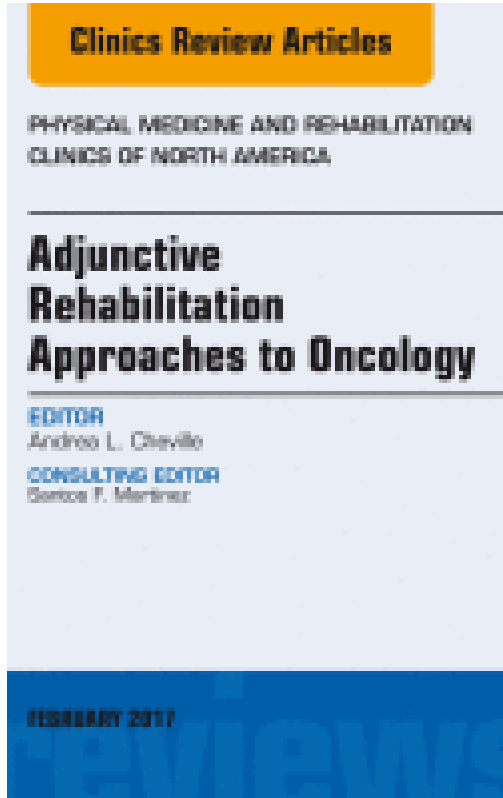


This patient guide will help you understand:

What is cancer-related fatigue?	pg 2
What causes cancer-related fatigue?	pg 3
What can I do to manage my fatigue?	pg 4
When should I talk to my health care team?	pg 12
Where can I get more information?	pg 14

This guide is for people who have fatigue before, during or after cancer treatment. It can be used by patients and the patient's family, friends or caregivers. It does not replace advice from your health care team.

Definition



Cancer-Related Fatigue Persistent, Pervasive, and Problematic



Lynn H. Gerber, MD^{a,b,*}

Phys Med Rehabil Clin N Am 28 (2017) 65–88

[Physical Medicine and Rehabilitation Clinics of North America](#) _
Volume 28, Issue 1
2017-1-31, Pages i-214

Definition

The National Comprehensive Cancer Network

“an unusual, persistent, subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning.”

4 criteria to establish the diagnosis:

1. period of ≥ 2 wks within the preceding month during which significant CRF or $\downarrow$ energy was experienced each day or almost every day along with additional CRF-related symptoms;
2. experience of CRF results in significant distress or impairment of function;
3. the presence of clinical evidence suggesting that CRF is a consequence of CA or CA therapy;
4. CRF is not primarily a consequence of a concurrent psychiatric condition, such as major depression.

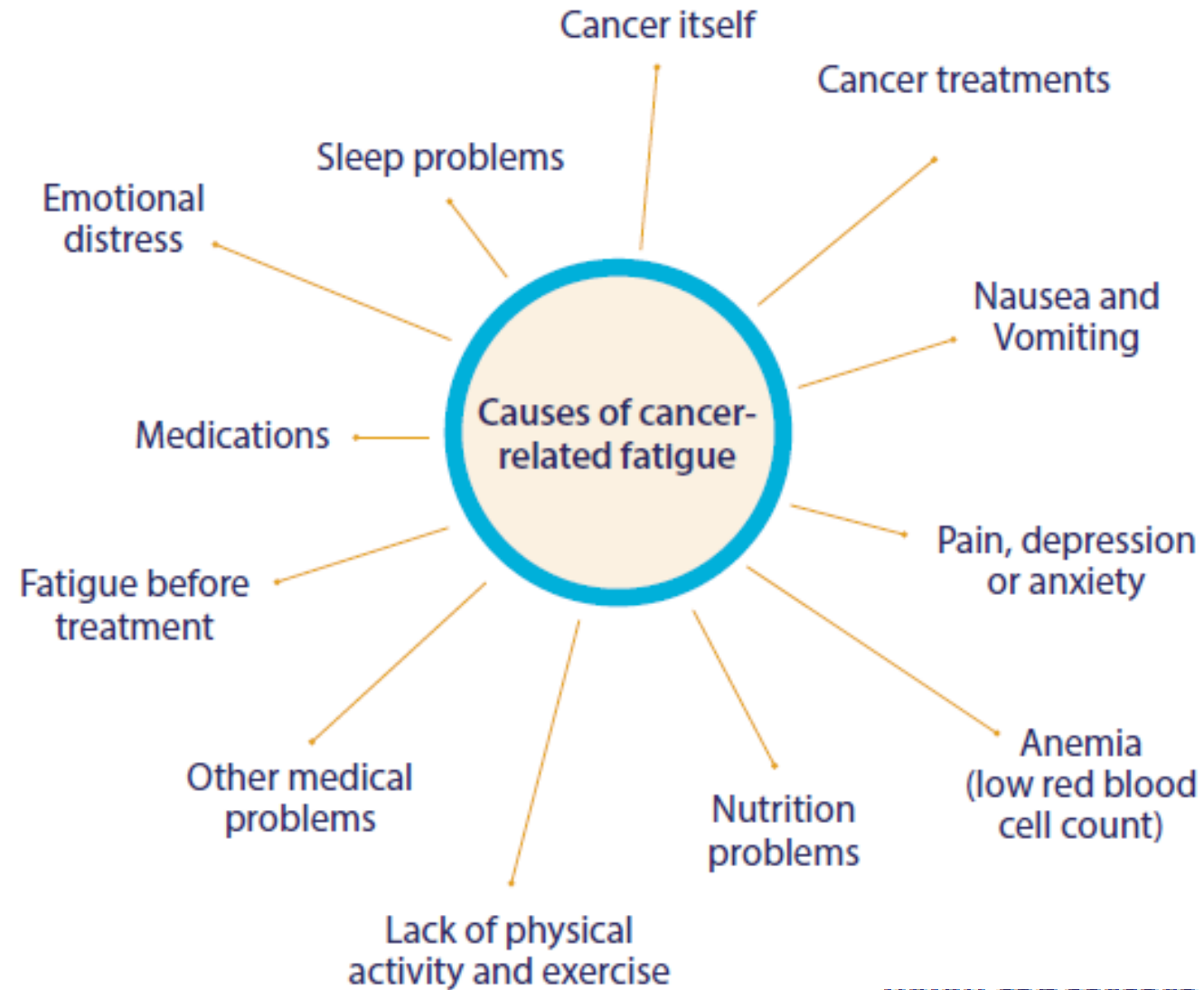


Table 1
Comorbid conditions associated with fatigue

Common	Less Common	Rare
Anemia	Renal failure	Adrenal insufficiency
Hyper/hypothyroidism	Liver disease	Lyme disease
Atrial fibrillation	Chronic obstructive pulmonary disease/multiple sclerosis	Fibromyalgia
Infection	Hypercalcemia	
Medications (eg, hypnotics, opioids)	Arthritis	
Depression/anxiety	Autoimmune disease	
	Vitamin D deficiency	

Table 1
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Box 1

Conditions contributing to fatigue

Deconditioning

Inactivity

Insomnia

Stress (physical and emotional)

Dehydration

Nutritional deficiencies

Table 2

Associations used to help distinguish between physical and central fatigue

Symptoms	Physical Fatigue	Central Fatigue
Decreased ability to perform activity, decreased exercise tolerance	+++	+/-
Dyspnea on exertion	+++	+
Muscle fatigue/weakness	+++	-
Mood/behavioral change	+	+++
Change in reaction time and attention to task	+/-	+
Decline in cognitive performance	+/-	+++
Lack of motivation	+/-	+++

+++ , most likely associated with type of fatigue; ++ , less likely associated with type of fatigue; + , least likely associated with type of fatigue; +/- , occasionally associated with type of fatigue; - not associated with type of fatigue.

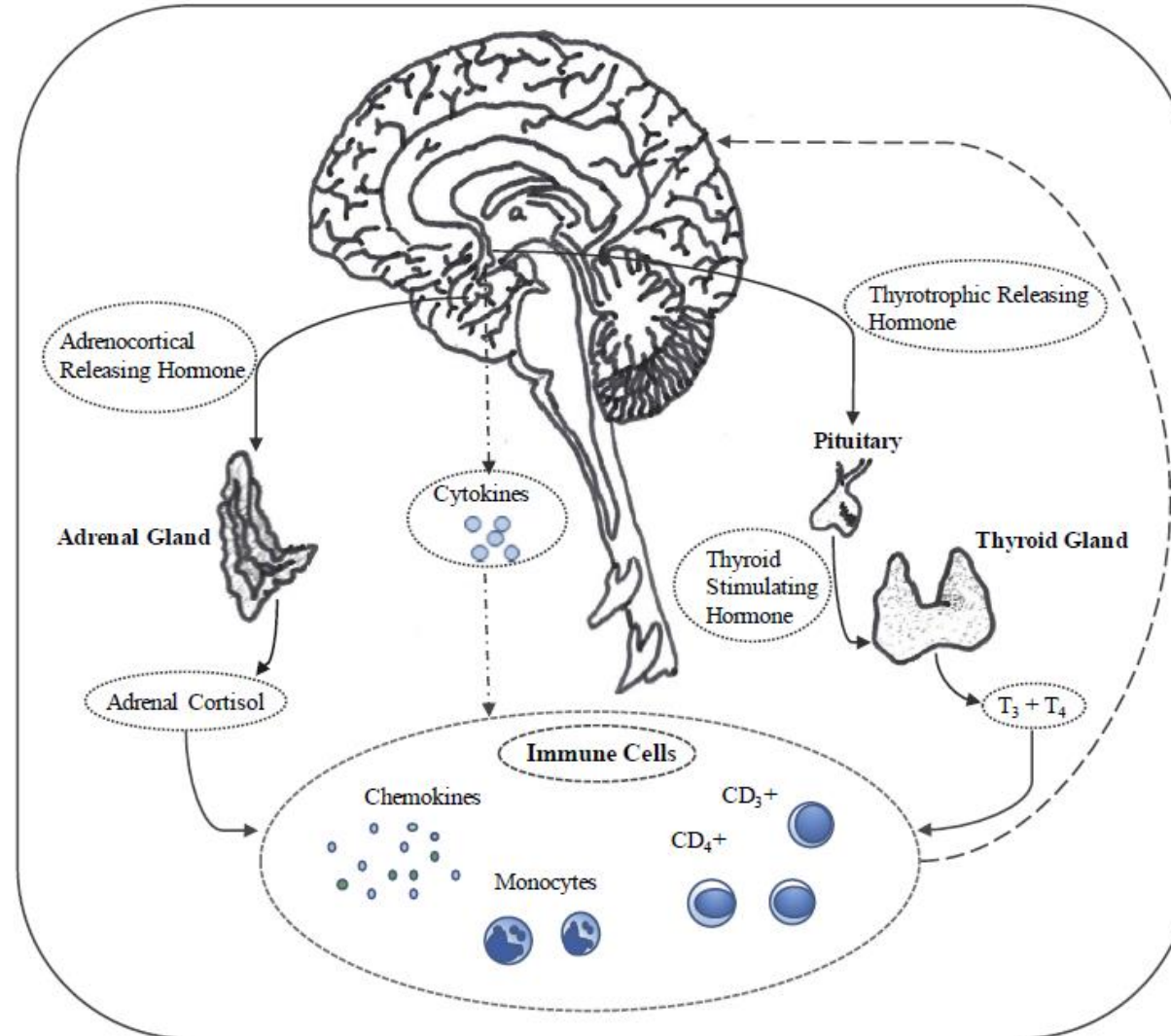


Fig. 1. Schematic for neuro-immune regulation.

Table 3
Fatigue scales commonly used to evaluate cancer-related fatigue

	Name of Instrument	Dimensions of Measurement	CSF Score	Reference
1	Fatigue Inventory Scale	Physical, cognitive, and psychosocial fatigue	≥ 3	Fisk
2	Fatigue Severity Scale	9 questions, no clear dimensional separate	≥ 40	Krupp
3	Visual Analog Scale	One dimension	4	
4	Medical Outcome Study Short Form-36	Vitality subscale	>45	Ware
5	FACIT-F	Multidimensional		Yellen
6	EORTC	Physical and mental fatigue		Knobel
7	PROMIS	Multidimensional, custom questions from item banks		

Abbreviations: CSF, clinically significant fatigue; EORTC, European Organization for Research and Treatment; FACIT-F, Functional Assessment of Chronic Illness Therapy-F; PROMIS, Patient-Reported Outcomes Measurement Information System.

0 is no fatigue and 10 is the worst possible fatigue.

1-3

You may have
Mild fatigue if:

You have some
symptoms of fatigue

You are able to do
regular activities like
caring for yourself,
cooking, cleaning
or working

4-6

You may have
Moderate fatigue if:

Your fatigue causes
you moderate stress
and worry

You have trouble doing
regular activities like
caring for yourself,
cooking, cleaning
or working

You have trouble
walking or
climbing stairs

7-10

You may have
Severe fatigue if:

Your fatigue is strong
and causes you high
levels of stress
and worry

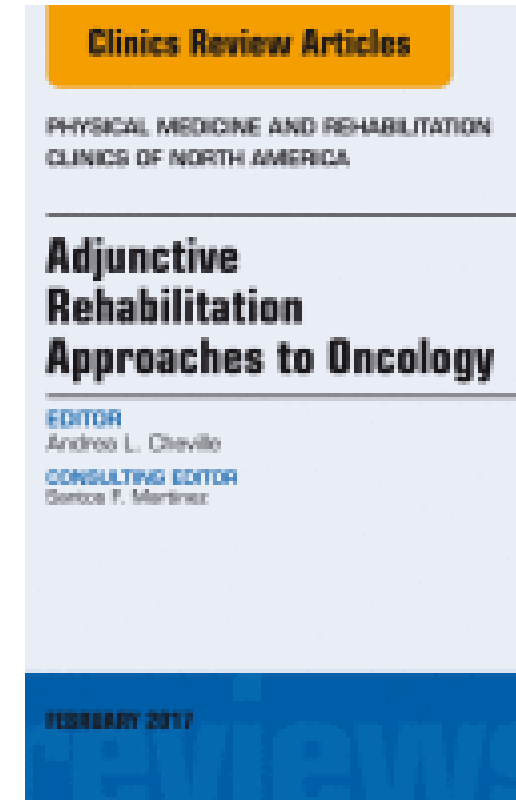
You want to sit, lie
down or sleep all day

You are not able to do
regular activities like
caring for yourself,
cooking, cleaning,
or working

When resting you may
feel sudden fatigue and/
or shortness of breath,
rapid heart rate and/or
have low blood count

Treatment & Management of Cancer-Related Fatigue

- **Education & Counselling**
- **Pharmacological Interventions**
 - Hematopoietic Stimulants
 - Hormones
 - Psychostimulants & Antidepressants
- **Non-pharmacological interventions**
 - Exercises & Rehabilitation modalities
 - Cognitive behavioral Therapy



Be Active

Exercise is a great way to improve your energy and make your fatigue better.



Aim to get 30 minutes of moderate exercise on most days.

The exercise should not be too easy or too hard. You should be able to talk easily while you are exercising.

If 30 minutes of activity is too hard,
split it up into shorter 5 to
10 minute sessions.

Improve your sleep

Getting good sleep can give you more energy.



Manage stress and emotions

Talking to someone about your feelings and doing activities to help with stress and anxiety can help your fatigue.



Find support

You don't have to cope with your fatigue alone. You can find support in your community and through your healthcare team.



Pace yourself

Use your energy wisely in order to be able to do the things that are most important to you.



Eat well

Eat healthy foods and lots of variety to have more energy.



Be patient. Feeling better will take time.

Small changes can improve your fatigue over time.



Education & Counselling

Energy conservation, Coping, Symptom control

- [Goedendorp MM, Gielissen MF, Verhagen CA, et al. Psychosocial interventions for reducing fatigue during cancer treatment in adults \[serial online\]. Cochrane Database Syst Rev 2009;\(91\):CD006953.](#)
- [Jacobsen P, Donovan KA, Vadaparampil S, et al. Systematic review and metaanalysis of psychological and activity based interventions for cancer-related fatigue. Health Psychol 2007;26:660–7.](#)
- [Purcell A, Fleming J, Burmeister B, et al. Is education an effective management strategy for reducing cancer-related fatigue? Support Care Cancer 2011;19: 1429–39.](#)

In conclusion: "Generally good results in this type of intervention".

Pharmacological Interventions

- **Hematopoietic Stimulants:**

- Erythropoietic stimulation =>
 - ↓ need for transfusion, ↑ **thromboembolic events**
 - ? ↓ fatigue

Grant MD, Piper M, Bohlius J, et al. **Epoetin and darbepoetin for managing anemia in patients undergoing cancer treatment: comparative effectiveness update.** Rockville (MD): Agency for Healthcare Research and Quality (US); 2013.

- **Hormones:**

- Corticosteroids- used in advanced cancer
 - Help with appetite loss, nausea, & fatigue
 - small studies, short duration

Yennurajalingam S, Frisbee-Hume S, Palmer JL, et al. **Reduction of cancerrelated fatigue with dexamethasone: a double-blind, randomized, placebocontrolled trial in patients with advanced cancer.** J Clin Oncol 2013;31 Phys Med Rehabil Clin N Am 28 (2017) 65–88

Pharmacological Interventions

- **Psychostimulants & Antidepressants:**

- **Methylphenidate**

- most studied drug
 - it is superior to placebo
 - no adverse effect reported

Minton O, Richardson A, Sharpe M, et al. **A systematic review and meta-analysis of the pharmacological treatment of cancer-related fatigue.** J Natl Cancer Inst 2008;100:1155–66.

- **Modafinil**

- Positive effect shown

Mu"cke M, Mochamat M, Cuhls H. **Pharmacological treatments for fatigue associated with palliative care.** Cochrane Database Syst Rev 2015;(5):CD006788.

Non-pharmacological interventions

Exercises & Rehabilitation modalities

- Berger AM, Mitchell SA, Jacobsen PB. **Screening, evaluation, and management of cancer-related fatigue: ready for implementation to practice?** CA Cancer J Clin 2015;65:190–211.
- Bower JE. **Cancer-related fatigue: mechanisms, risk factors, and treatments.** Nat Rev Clin Oncol 2014;11:597–609.
- MacVicar MG, Winningham ML. **Promoting the functional capacity of cancer patients.** Cancer Bull 1986;38:235–9.
- Dimeo FC, Tilmann MH, Bertz H, et al. **Aerobic exercise in the rehabilitation of cancer patients after high dose chemotherapy and autologous peripheral stem cell transplantation.** Cancer 1997;79:1717–22.
- Tomlinson D, Diorio C, Beyene J, et al. **Effect of exercise on cancer-related fatigue: a meta analysis.** Am J Phys Med Rehabil 2014;93:675–86.

Non-pharmacological interventions

Exercises & Rehabilitation modalities.

- Cramp F, Byron-Daniel J. **Exercise for the management of cancer related fatigue in adults.** Cochrane Database Syst Rev 2012;(11):CD006145
- Eickmeyer SM, Gamble GL, Shahpar S, et al. **The role and efficacy of exercise in persons with cancer.** PM R 2012;4:874–81.
- Puetz TW, Herring MP. **Differential effects of exercise on cancer-related fatigue during and following treatment: a meta-analysis.** Am J Prev Med 2012;43:e1–24.
- Mishra SI, Scherer RW, Snyder C, et al. **Exercise interventions on health-related quality of life for people with cancer during active treatment.** Cochrane Database Syst Rev 2012;(8):CD008465.
- Velthuis MJ, Agasi-Idenburg SC, Aufdemkampe G, et al. **The effect of physical exercise on cancer-related fatigue during cancer treatment: a meta-analysis of randomised controlled trials.** Clin Oncol (R Coll Radiol) 2010;22(3):208–21.

Exercises & Rehabilitation modalities

- **Positive effects** of exercise interventions are more pronounced with **moderate-intensity** or **vigorous-intensity** versus mild-intensity exercise programs
- The strongest evidence for effectiveness in treating CRF is exercise
 - Aerobic
 - Resistance
 - multimodal with higher-intensity exercise
- exercise for:
 - Inpatients
 - Outpatients
 - Home
 - Community based

Exercises & Rehabilitation modalities

- Improvements were significant:
 - in blood pressure
 - upper and lower body strength
 - the 6-minute walk test
 - fatigue
- Safety & effectiveness
 - during treatment
 - Posttreatment
 - Survivorship
- General principles are intensity (60%–85% of maximal heart rate) for at least 3 x per week in accordance with the American College of Sports Medicine Guidelines

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If 30 minutes of activity is too hard,
split it up into shorter 5 to
10 minute sessions.

How about Fracture risk & Exercise ?

Fracture risk

- Metastatic bone tumors:
 - Breast, Lung, Thyroid, Kidney, Prostate
(*BLT with Kosher Pickle*)
Spine>pelvis>lower limbs
 - Neuroblastoma most likely in children < 5 yo
- Most common primary bone tumors:
 - Osteogenic sarcoma
 - Chondrosarcoma
 - Ewing's sarcoma
- The most common cancer related pain is due to bone involvement.

Fracture risk

- Many cancer treatments affect crucial hormones for bone
- Bone marrow is intimately involved in metastatic processes
- Response criteria based on bone repair & destruction rather than changes in tumor volume

Fracture risk

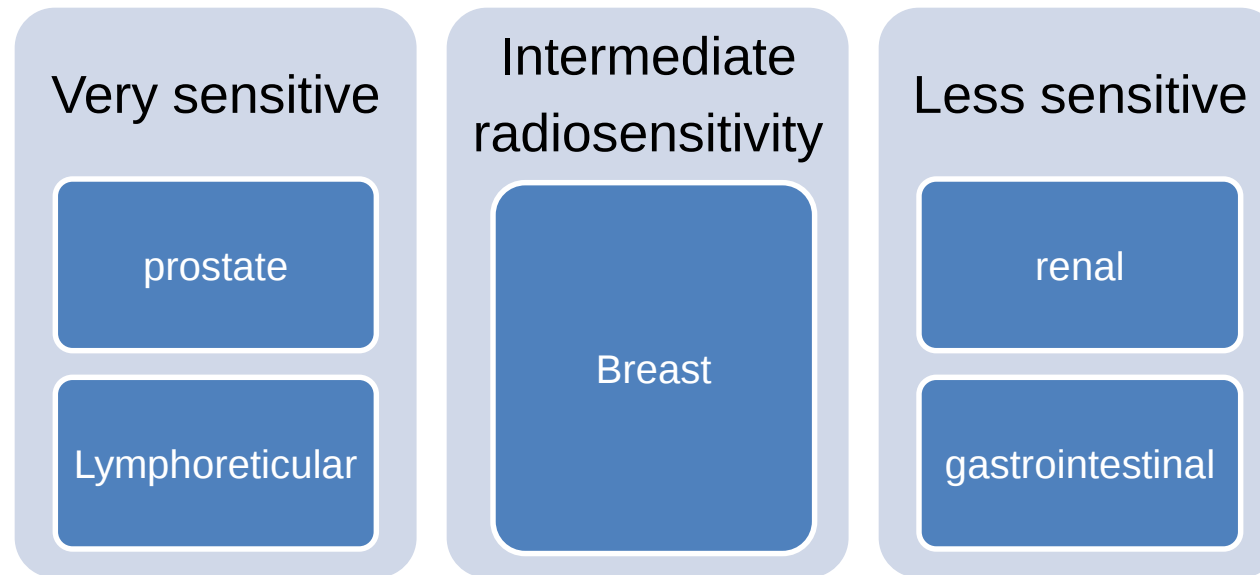
- Chemotherapy
- Ovarian failure (chemo-induced)
- Glucocorticoid administration
- Low body mass index
- Personal history of fragility fracture > 50 yo
- Family history
- Smoking
- Hormone manipulation therapies
- Chronic inflammation
- ↓ vitamin D or calcium

***estrogen or androgen deprivation will increase fracture incidence by 40-50%**

Fracture risk

Average 19 month-survival after pathologic fracture

- Prostate: 29 months
- Breast: 23 months
- Renal: 12 Months
- Lung: 4 Months



Fracture risk

Treatment: bone metastasis

- Radiation for palliation of bone pain
- Bisphosphonates & denosumab delay complications, relieve symptoms, & improve QoL
- **Zoledronic acid (ZA)** - the most effective bisphosphonate for prevention of morbidity
- **Denosumab**- more effective than ZA for prevention of skeletal morbidity from solid tumors

Fracture risk

Treatment: bone metastasis

- Humerus@ high risk of fracture b/o rotational forces from muscle
- Proximal femur - most common site of mechanical failure under continuous axial & torsional stresses
- 65% of all fractures that require surgery are in the femur
- Femoral head or neck: bone resection and prosthetic replacement
- IM nailing: post-op survival time is most important risk factor for implant failure

Remineralization after chemotherapy



Fracture risk- *challenges*

- Bone lesions are not static
- Difficulty to measure size & cortical involvement
- 30-50% of normal bone must be lost to be seen on radiograph
- Consider absolute weight placed on the bone
- Co-morbidities

Table 1

Mirels' scoring system

Score	Site of lesion	Size of lesion	Nature of lesion	Pain
1	Upper limb	< 1/3 of cortex	Blastic	Mild
2	Lower limb	1/3–2/3 of cortex	Mixed	Moderate
3	Trochanteric region	> 2/3 of cortex	Lytic	Functional

(Adapted and published with permission of Lippincott Williams & Wilkins from Mirels H. Metastatic disease in long bones: a proposed scoring system for diagnosing impending pathologic fractures. *Clin Orthop Relat Res*. 1989;249:256–264.)

Table 2

Mirels' clinical recommendations

Mirels' score	Clinical recommendation
≤ 7	Radiotherapy and observation
8	Use clinical judgment
≥ 9	Prophylactic fixation

4.2.2 Harrington's Criteria for Risk of a Pathological Fracture in the Proximal Femur ¹³

- Any one of Harrington's classic definitions indicates a high risk of pathological fracture in the proximal femur (see Table 4). ¹³ [Level 3]

Table 4	Harrington's Criteria for Risk of a Pathological Fracture in the Proximal Femur ¹³ [Level 3]
1.	50% of circumferential cortical bone has been destroyed
2.	Where pain with weight-bearing stresses persists, increases or recurs, despite adequate local irradiation
3.	Lesions in the proximal femur in excess of 2.5cm in any dimension
4.	Lesions in the proximal femur associated with avulsion of the lesser trochanter

Fracture risk

Bed rest

- Contractures
- Deconditioning
- Orthostatic hypotension
- Pressure ulcers
- Osteoporosis
- Pneumonia
- DVT

Rehabilitation

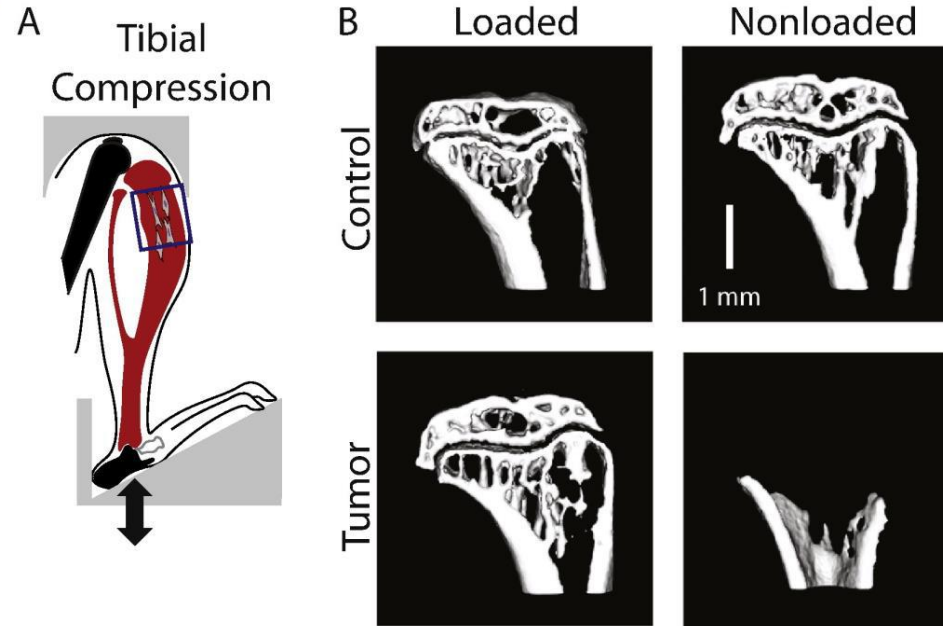
?

Pathologic Fracture Risk in Rehabilitation of Patients with Bony Metastases

ROBERT BUNTING, M.D., WENDY LAMONT-HAVERS, R.P.T.,
DONNA SCHWEON, R.P.T., AND ALLAN KLIMAN, M.D.

Clin Orthop 1985;192:222-227

- Moderate intensity exercise recommended, limited benefit over & above bisphosphonate treatment
- 8 of 460 studies included
 - **5 aerobic**
 - 4 resistance
 - 1 mixed
- Aerobic with a variety of loading regimens: upper and lower body musculature and/or trunk rotation
- Resistance with applied force to hip & spine



In mice:

- intratibial injection of breast CA cells + tibial compression= prevention of osteolysis & secondary tumor formation

Anabolic loading may be considered to inhibit osteolytic remodeling during breast cancer bone metastasis

Fracture risk- *guidelines*

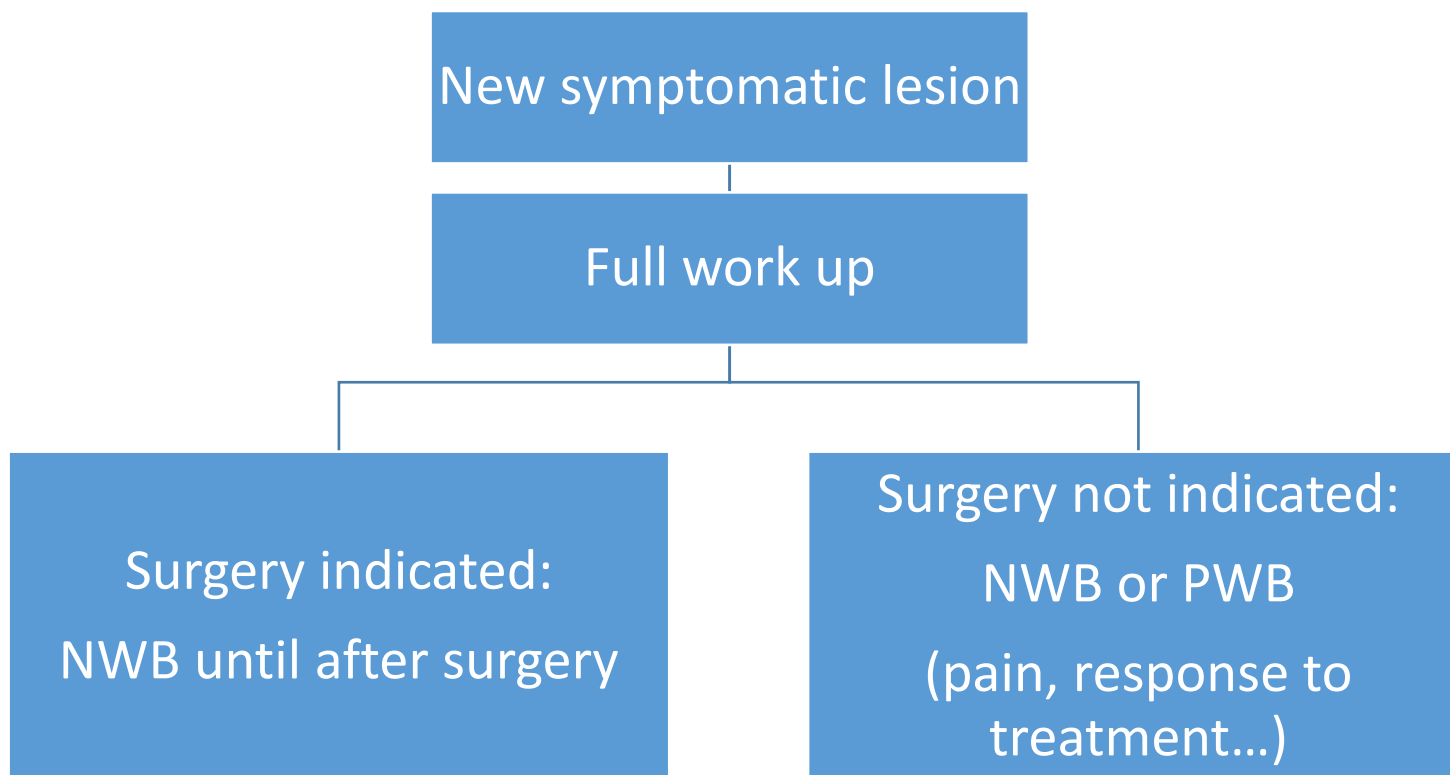
- Activity-related pain & radiographic lesion => ambulatory aid

Avoid:

- MMT/resistive exercises on involved limb
- Passive or active assisted ROM
(only pt directed active ROM (pain limiting))

No percussion/vibration chest PT on pts w rib mets

Bony lesions *-guidelines*



1. Assess metastases using the Mirels and Harrington score.
2. If Mirels score 7 or more; orthopedic consultation before weight bearing
3. 3. If mirels score is 6 or less WBAT and reimage if symptoms change
4. If Mirels score is 7, supported weight bearing at all times with a _____.
5. If Mirels score is 8 or higher touch or non weight bearing while awaiting surgery. If surgery is not to be done continue touch or supported weight bearing at all times with a _____.after full informed consent.

Cancer Rehabilitation Ward protocol

Juravinski Hospital

by Dr. D. Harvey

Prevention of fracture

- **Bisphosphonates** ↓ frequency of bone metastasis & improve survival in **postmenopausal** women with breast cancer
 - do not improve disease outcomes in **premenopausal** women
- **Denosumab** delays bone metastasis in castrate-resistant prostate cancer
- **Bisphosphonates & denosumab** prevent bone loss associated with the use of ovarian suppression or aromatase inhibitors in early breast & androgen deprivation in prostate ca

Objectives

At the end of presentation:

- Learners are become familiar with available Cancer Rehabilitation pathways in Niagara Region
- Learners are aware of the current evidence how to fight Cancer related fatigue
- Learners are aware of current recommendations related to exercise despite bony metastatic disease & how to maintain a bone health



**Thank
You!!!**

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