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

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2nd Annual Update in Rehabilitation Medicine 2018
St. Catharine’s, ON
February 28, 2018
Faculty/Presenter Disclosure

• **Faculty:** Dr. Tatjana Zdravkovic, MD FRCPC

• **Relationships with commercial interests:**
  – **Grants/Research Support:** None
  – **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

- Cancer 30.2%
- Heart disease 19.7%
- Other 24.9%
- Chronic lower respiratory diseases 4.5%
- Cerebrovascular diseases 5.3%
- Accidents 4.6%
- Diabetes 2.8%
- Alzheimer’s disease 2.6%
- Influenza and pneumonia 2.3%
- Suicide 1.6%
- Kidney disease 1.5%

Note: The total of all deaths in 2012 in Canada was 246,596.
810,045 Canadians were alive at the beginning of 2009 with a cancer diagnosed in the previous 10 years

2 in 5 Canadians will develop cancer in their lifetime

60% The five-year survival probability, in Canada, that would be observed in the hypothetical situation where cancer is the only possible cause of death

202,400 Canadians will be diagnosed with cancer in 2016

78,800 Canadians will die of cancer in 2016

1 in 4 Canadians will die from cancer
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
- Physiatrist
- 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

Diagnosis of cancer: Triage by NP

- No Functional Deficit
- Functional Deficit

Physiatry Consult

Exercise for Health promotion
- ▲ Secondary prevention
- ▲ QOL
- ▼ Symptoms: Sleep, fatigue, anxiety
- ▲ Blood counts and chance of completing chemo
- ▲ Bone density

Cancer Impairment very stable
- Outpatient exercise and functional restoration

Cancer Impairment needs medical monitoring but not the predominate need
- Inpatient rehab: Functional restoration and discharge planning

Cancer impairment predominates and precludes active therapy
- Inpatient Oncology with ongoing consultation form PM&R

Research related to: Effects of cancer on muscle, aerobic capacity, and bones, and exercise capacity
Effects of exercise and improved function on survival, QOL, function, action of cancer cells
Developing guidelines for cancer patients to participate safely in rehabilitation programs

Pre and post cancer treatment exercise and functional restoration from the day of diagnosis
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*, D Harvey, J Park Dorsay, S Jiang and MP Rathbone
Rehabilitation in primary and metastatic brain tumours

Impact of functional outcomes on survival

Authors

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

Authors and affiliations
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
Oncology Rehabilitation Clinic
“Maximizing function across the continuum of cancer care”
Phone: 905-574-8515
Fax: 905-575-1598

Date: 

Referring provider:  
Primary Care provider:  
Radiation Oncologist:  
Medical Oncologist:  
Surgeon:  
Oncological diagnosis:  
Summary of Oncology treatment:  

Reason for referral:

- restrictions in ambulation/mobility
- limitations in ADLs
- restrictions in community participation
- fatigue/desconditioning
- exercise prescription

Other:  

David T. Harvey, MD FRCPC  Dr. Tatjana Zivadinovic, MD FRCPC  Jan Park Borch  RN CCRN(C)
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: ________________________
Summary of Oncology treatment: ____________________________________________

________________________________________________________________________

________________________________________________________________________

Reason for referral:

restrictions in ambulation/mobility  foot drop
restrictions in ADLs               wrist drop
restrictions in community participation  spasticity
fatigue/deconditioning             neuropathy
exercise prescription              muscle weakness

Other: ____________________________________________________________________

________________________________________________________________________

________________________________________________________________________
CanWell

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.

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**Program Location**

Les Chater Family YMCA
355 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.
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. MacDermid³
CLICK 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!
WHAT’S ON?
MARCH & APRIL
2018

• 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.

Find out more by visiting wellspringniagara.ca

WELLSPRING NIAGARA
3-3250 Schmon Parkway, Thorold, ON L2V 4Y6
905-684-7619
- 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*†

Current Oncology, Vol. 24, No. 5, October 2017 © 2017 Multimed Inc.
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.
Definition

Cancer-Related Fatigue
Persistent, Pervasive, and Problematic

Lynn H. Gerber, MD

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 ↓ 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.
Causes of cancer-related fatigue:

- Cancer itself
- Cancer treatments
- Nausea and Vomiting
- Pain, depression or anxiety
- Anemia (low red blood cell count)
- Fatigue before treatment
- Other medical problems
- Lack of physical activity and exercise
- Medications
- Sleep problems
- Emotional distress
- Nutrition problems
<table>
<thead>
<tr>
<th>Common</th>
<th>Less Common</th>
<th>Rare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>Renal failure</td>
<td>Adrenal insufficiency</td>
</tr>
<tr>
<td>Hyper/hypothyroidism</td>
<td>Liver disease</td>
<td>Lyme disease</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>Chronic obstructive pulmonary disease/multiple sclerosis</td>
<td>Fibromyalgia</td>
</tr>
<tr>
<td>Infection</td>
<td>Hypercalcemia</td>
<td></td>
</tr>
<tr>
<td>Medications (eg, hypnotics, opioids)</td>
<td>Arthritis</td>
<td></td>
</tr>
<tr>
<td>Depression/anxiety</td>
<td>Autoimmune disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vitamin D deficiency</td>
<td></td>
</tr>
<tr>
<td>Common</td>
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</tr>
<tr>
<td></td>
<td><strong>Vitamin D deficiency</strong></td>
<td></td>
</tr>
<tr>
<td>Box 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions contributing to fatigue</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Deconditioning
- Inactivity
- Insomnia
- Stress (physical and emotional)
- Dehydration
- Nutritional deficiencies
### Table 2
Associations used to help distinguish between physical and central fatigue

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

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

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.
<table>
<thead>
<tr>
<th>1-3</th>
<th>4-6</th>
<th>7-10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mild</strong> fatigue if:</td>
<td><strong>Moderate</strong> fatigue if:</td>
<td><strong>Severe</strong> fatigue if:</td>
</tr>
<tr>
<td>You have some symptoms of fatigue</td>
<td>Your fatigue causes you moderate stress and worry</td>
<td>Your fatigue is strong and causes you high levels of stress and worry</td>
</tr>
<tr>
<td>You are able to do regular activities like caring for yourself, cooking, cleaning or working</td>
<td>You have trouble doing regular activities like caring for yourself, cooking, cleaning or working</td>
<td>You want to sit, lie down or sleep all day</td>
</tr>
<tr>
<td></td>
<td>You have trouble walking or climbing stairs</td>
<td>You are not able to do regular activities like caring for yourself, cooking, cleaning, or working</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When resting you may feel sudden fatigue and/or shortness of breath, rapid heart rate and/or have low blood count</td>
</tr>
</tbody>
</table>
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.

www.cancercare.on.ca/symptoms
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.

www.cancercare.on.ca/symptoms
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.

www.cancercare.on.ca/symptoms
Education & Counselling

Energy conservation, Coping, Symptom control


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

Pharmacological Interventions

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


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

Pharmacological Interventions

• Psychostimulants & Antidepressants:
  • Methylphenidate
    • most studied drug
    • it is superior to placebo
    • no adverse effect reported


• Modafinil
  • Positive effect shown

Non-pharmacological interventions

Exercises & Rehabilitation modalities

Non-pharmacological interventions

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
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.

www.cancercare.on.ca/symptoms
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

AAPM&R 2017 ANNUAL ASSEMBLY PRE CONFERENCE
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 facture 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

<table>
<thead>
<tr>
<th>Score</th>
<th>Site of lesion</th>
<th>Size of lesion</th>
<th>Nature of lesion</th>
<th>Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Upper limb</td>
<td>&lt; 1/3 of cortex</td>
<td>Blastic</td>
<td>Mild</td>
</tr>
<tr>
<td>2</td>
<td>Lower limb</td>
<td>1/3–2/3 of cortex</td>
<td>Mixed</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>Trochanteric region</td>
<td>&gt; 2/3 of cortex</td>
<td>Lytic</td>
<td>Functional</td>
</tr>
</tbody>
</table>


Table 2
Mirels’ clinical recommendations

<table>
<thead>
<tr>
<th>Mirels’ score</th>
<th>Clinical recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 7</td>
<td>Radiotherapy and observation</td>
</tr>
<tr>
<td>8</td>
<td>Use clinical judgment</td>
</tr>
<tr>
<td>≥ 9</td>
<td>Prophylactic fixation</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Table 4</th>
<th>Harrington’s Criteria for Risk of a Pathological Fracture in the Proximal Femur (^{13}) [Level 3]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>50% of circumferential cortical bone has been destroyed</td>
</tr>
<tr>
<td>2.</td>
<td>Where pain with weight-bearing stresses persists, increases or recurs, despite adequate local irradiation</td>
</tr>
<tr>
<td>3.</td>
<td>Lesions in the proximal femur in excess of 2.5cm in any dimension</td>
</tr>
<tr>
<td>4.</td>
<td>Lesions in the proximal femur associated with avulsion of the lesser trochanter</td>
</tr>
</tbody>
</table>
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

New symptomatic lesion

Full work up

Surgery indicated: NWB until after surgery

Surgery not indicated: NWB or PWB (pain, response to treatment...)

Custodio

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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!!!