

PHYSICAL ACTIVITY DURING AND AFTER TREATMENT: THE BENEFITS AND POTENTIAL BARRIERS

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Leukemia and Lymphoma

- Lymphoma: cancer of the lymphatic system (helps with immunity).
 - ▣ There are two major types: Hodgkin Lymphoma (HL) and Non-Hodgkin Lymphoma (NHL).
 - ▣ The incidence is expected to be roughly 79,000 for the two lymphomas in 2013 (HL: 9000, NHL: 70,000).
- Leukemia: cancer of the blood
 - ▣ There are 5 major types of leukemia .
 - ▣ Acute Lymphoblastic Leukemia (ALL) is the most common childhood cancer.
 - ▣ 49,000

Incidence numbers are from the National Cancer Institute

Treatment

- Chemotherapy
- Radiation
- Stem Cell Transplant

Survival

- 156000+ estimated new cases of lymphoma, myeloma, and leukemia.
 - ▣ Estimated 101,070 survivors (65% survival)
- 2/3 of people with ADVANCED Hodgkin's disease can be cured.
- There is approximately a 50% 5 year survival rate for NHL patients.
- 80% of children with leukemia survive cancer.

Case 1

- Mary is a 59 year old with NHL (Diffuse Large B Cell Lymphoma).
- She has Diabetes Mellitus, is a little overweight, and has osteopenia, but otherwise is healthy.
- Diagnosed recently after developing a persistent cough.
 - ▣ Mediastinal lymph nodes are seen on chest X-ray.



Case 1

- She begins Induction Chemotherapy with R-CHOP and then rituximab.
- Her blood sugars are more difficult to control.
- She develops numbness and burning in her feet.
- Mary is tired and doesn't get out of bed much.



www.divabetic.wordpress.com

www.fotosearch.com



brauci0133s fotosearch.com

Case 1

- The nurses become concerned and ask her oncologist to consult Physical Medicine and Rehabilitation (PM&R).
 - ▣ She is diagnosed with neuropathy and started on a nerve membrane stabilizer.
 - ▣ She is also diagnosed with steroid myopathy, but due to her treatment, the prednisone dose cannot be decreased at this time.
 - ▣ Physical and Occupational therapies are ordered.

Case 1

- Mary is surprised to find that with the therapy and activity she feels better than when she was just staying in bed.
 - ▣ less fatigue
 - ▣ less nausea
 - ▣ less pain
 - ▣ improved mood
 - ▣ Improved overall physical functioning

(Alibhai, Chang, Wiskemann, Jarden)



www.bendbulletin.com

Case 1

- Mary then begins radiation to the region with affected lymph nodes.
- Radiation is going well, but then she develops severe back pain.
 - ▣ Concern for CNS involvement ...

Case 1



www.orthoinfo.aaos.org

- Found to have a thoracic compression fracture and osteoporosis (Majhail)
- PM&R physician
 - ▣ Asks the physical therapist to strengthen Mary's back and abdominal muscles, but avoid flexion. Later asks therapist to focus on resistive strength training (Florin)
 - ▣ Prescribes a TLSO (back brace) for comfort when she is standing up until her core and back muscles are stronger
 - ▣ Prescribes Calcium, Vitamin D, and a bisphosphonate (Florin)
 - ▣ Prescribes pain medication for her bony pain.

Case 1

- Unfortunately Mary has a relapse after 14 months and she begins the process for autologous stem cell transplant.
 - Conditioning: dexamethasone, cisplatin, cytarabine,
 - then stem cell transplant
- She remembers to stay as active as she can during treatment and feels fairly well compared to other patients on the floor undergoing SCT
 - She walks around the unit with the nursing staff and uses the stationary bicycle 5 days/week
 - She uses therabands with the occupational therapist to strengthen her arms
 - She practices relaxation and deep breathing to help with aches and pains
(Jarden, Bauman, Majhail)



www.txortho.com

www.livestrong.com

Case 1

- Mary does well with treatment.
- She is able to discharge home and returns to her hobbies. After a couple of months, she returns to work.
- Mary also decides to join a Tai Chi and gets her friends to walk with her a few times a week. (Hackney, Schmitz)



www.swimmingdragontaichi.com

Case 2

- Ben is a 32 year old who was treated and survived ALL as a child.
- He was diagnosed at age 4. He nor his parents remember what his chemotherapy consisted of (Hudson, Suh)
 - ▣ Induction: vincristine, prednisone, L-asparaginase, and later doxorubicin was added
 - ▣ Consolidation: doxorubicin
- He received prophylactic whole brain irradiation.



www.news.yahoo.com

Case 2

- He comes in to see his primary care physician for foot pain.
- Notes the following:
 - ▣ Pain started at work (UPS delivery man). May have tripped, which is common for him.
 - ▣ Gets a little short of breath with activity
- Upon further questioning
 - ▣ He has tingling in his feet and has had poor balance “as long as I can remember.”
 - ▣ He graduated high school with difficulty and did not go to college. He notes trouble concentrating.
 - ▣ He has gained 30 lbs since his early 20s. He does not exercise. Although enjoys watching, he has never participated in sports due to his clumsiness.

Case 2

- He was diagnosed with stress fracture in his 2nd metatarsal (foot).
- He does not need surgery and is referred to outpatient PM&R for further evaluation.



Case 2

- **What is going on here?**
- Sensory neuropathy causing tingling and poor balance (vincristine)
- Mild cognitive impairments (whole brain radiation)
- Overweight/Obesity from inactivity (and to a lesser extent, poor balance)
- Cardiomyopathy on chest x-ray and then echocardiogram from doxorubicin
- Osteopenia from prednisone as a child as well as inactivity leading to increase risk for stress fracture

Case 2



www.123rf.com

www.athleticperformancetc.com

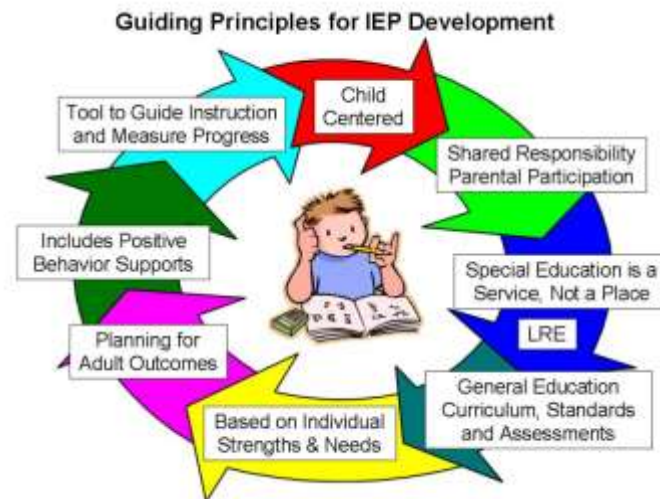


- What to do now?
 - ▣ Follow-up with cardiology for cardiomyopathy
 - ▣ Weight loss
 - ▣ Calcium and Vitamin D for osteopenia
 - ▣ Once fracture is healed, resistive strength training for osteopenia.
 - ▣ Nerve membrane stabilizers for neuropathy.
 - ▣ Physical Therapy for neuropathy (balance).
(Hudson, Badr, Jarden)

Case 2

- What could have been done earlier?
 - ▣ Physical Therapy for neuropathy
 - ▣ Speech and Language Pathology for cognitive impairments. Individualized Education Program as a child.

(Hudson)



Case 2

- What is he at risk for in the future if things do not change?
 - ▣ Further cardiovascular disease – besides the cardiomyopathy
 - ▣ Diabetes Mellitus
 - ▣ Osteoarthritis from overweight/obesity
 - ▣ Osteoporosis
 - But this can change with exercise and weight loss!
- (Florin, Badr, Hess, Hudson)

ACSM Guidelines for Exercise in Cancer Survivors

CANCER EXERCISE GUIDELINES: AVOID INACTIVITY

Table 1

Consult with your doctor before starting any exercise program. Begin exercising as soon as possible following surgery or other phases of cancer treatment. Continue normal daily activities and exercise as much as possible during and after non-surgical treatments. Do whatever is possible, and work towards meeting the recommended amount.

AEROBIC EXERCISE = Perform 150 minutes per week of moderately-intense activity (progress by increasing time and intensity) or 75 minutes per week of vigorous exercise.

STRENGTH TRAINING = Perform 2-3 weekly sessions that include exercises for major muscle groups: 8-10 exercises of 10-15 repetitions/set, at least one set per session. Major muscle groups include chest, back, arms, shoulders, abdominals, gluteals, quadriceps, hamstring, and calf.

FLEXIBILITY/RANGE OF MOTION = Every day (flexion, extension, lateral movements, and rotation), still focusing on the major muscle groups and joints. And don't forget about the spine!

Problems Faced During Treatment That May Impact Functioning

- Neuropathy
- CNS (brain or spinal cord) involvement
- Osteopenia/osteoporosis
- Steroid myopathy
- Confusion
- Pulmonary toxicity
- Cardiomyopathy, pericarditis, myocarditis
- Graft Versus Host Disease (GVHD)

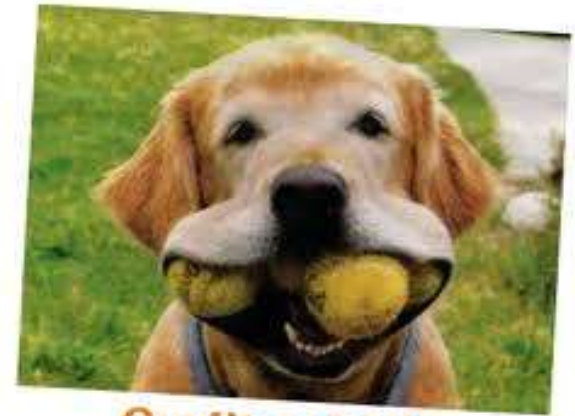
Problems Faced After Treatment That May Impact Functioning

- Neuropathy
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- Steroid Myopathy
- Graft Versus Host Disease
- Cardiomyopathy
- Pulmonary toxicity
- “Chemo brain” – difficulty with multi-tasking or memory



What is Physical Medicine & Rehabilitation?

- PM&R, also called physiatry, is a medical specialty focused on the prevention, diagnosis, and nonsurgical treatment of disorders associated with disability, including cancer.
- Cancer Rehabilitation is a subspecialty of rehabilitation medicine concerned with restoring the highest possible functional status and quality of life to cancer patients and survivors.



Quality of Life

What is PM&R



- We work closely with physical, occupational, and speech therapies.
- Focus:
 - ▣ Restore function
 - ▣ Maintain mobility and ability to perform daily activities
 - ▣ Improve quality of life

What Can PM&R Help With?

- Improve weakness (both focal and generalized) and endurance
- Improve fatigue
- Improve balance and gait
- Treat and alleviate pain (neuropathic and musculoskeletal)
- Treat spasticity or muscle spasms from neurological disorders
- Assess for medical equipment and assistive devices to enable independence



Questions?

- Thank you!



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