

Functional Training to Reduce Fall Risk in a Patient Following Cancer Treatment: A Case Report



Kristin O'Kelly, BS, DPT Student
University of New England, Department of Physical Therapy

Background

- The National Cancer Institute reports that 39.6% of men and women will be diagnosed with some form of cancer during their lifetime.
- Studies have demonstrated that over half of cancer survivors age 55 and over have fallen in the past year, possible as a result of treatment and subsequent muscle weakness, difficulty with balance, and impaired walking.²
- Multiple studies have looked at the long term effects of cancer treatment and survivorship, but few studies look at interventions to combat decline in function.
- Purpose of this case report was to report the interventions utilized in the treatment of an individual post-cancer treatment, with the intention of decreasing future fall risk by addressing three modifiable factors: muscle weakness, balance impairment, and walking difficulty.²**

Patient History

- A 76-year-old female referred to skilled nursing facility (SNF) with decreased functional mobility and a medical diagnosis of nausea, vomiting, and diarrhea secondary to radiation enteritis.
- One year ago, the patient was diagnosed stage II endometrioid adenocarcinoma and underwent total abdominal hysterectomy, bilateral salpingo-oophorectomy, and bilateral pelvic lymph node dissection as well as radiation for treatment.
- Past year of poor health (shingles, DVT, gastrointestinal bleeding, falls) resulting in prolonged periods of immobility.
- Participated in a total of 12 days of skilled PT services, for an hour each day, to address limitations in strength, balance, and aerobic capacity.
- Functional mobility and fall risk were assessed via six-minute walk test (6-MWT) and Berg balance scale (BBS).

Impairments

- Cardiovascular System:** Following 30ft ambulation, HR increased to 102 bpm, pt became SOB, edema present at bilateral ankles (2+ R, 3+ L).
- Integumentary System:** bruising at R antecubital space.
- Neuromuscular System:** balance impairment.
- Musculoskeletal System:** bilateral LE gross strength impairment, gait impaired secondary to LE strength, balance and CV endurance impairments.

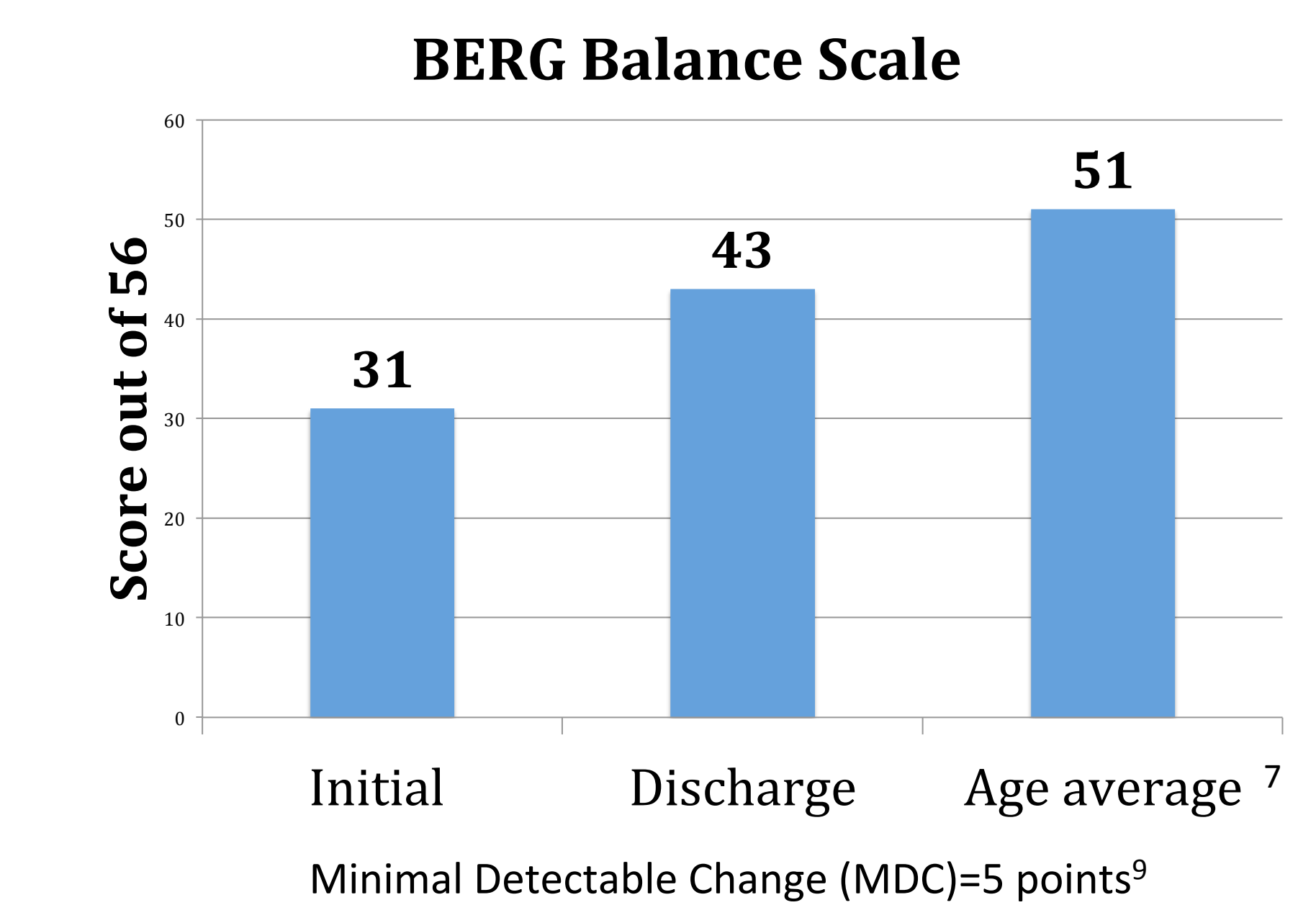
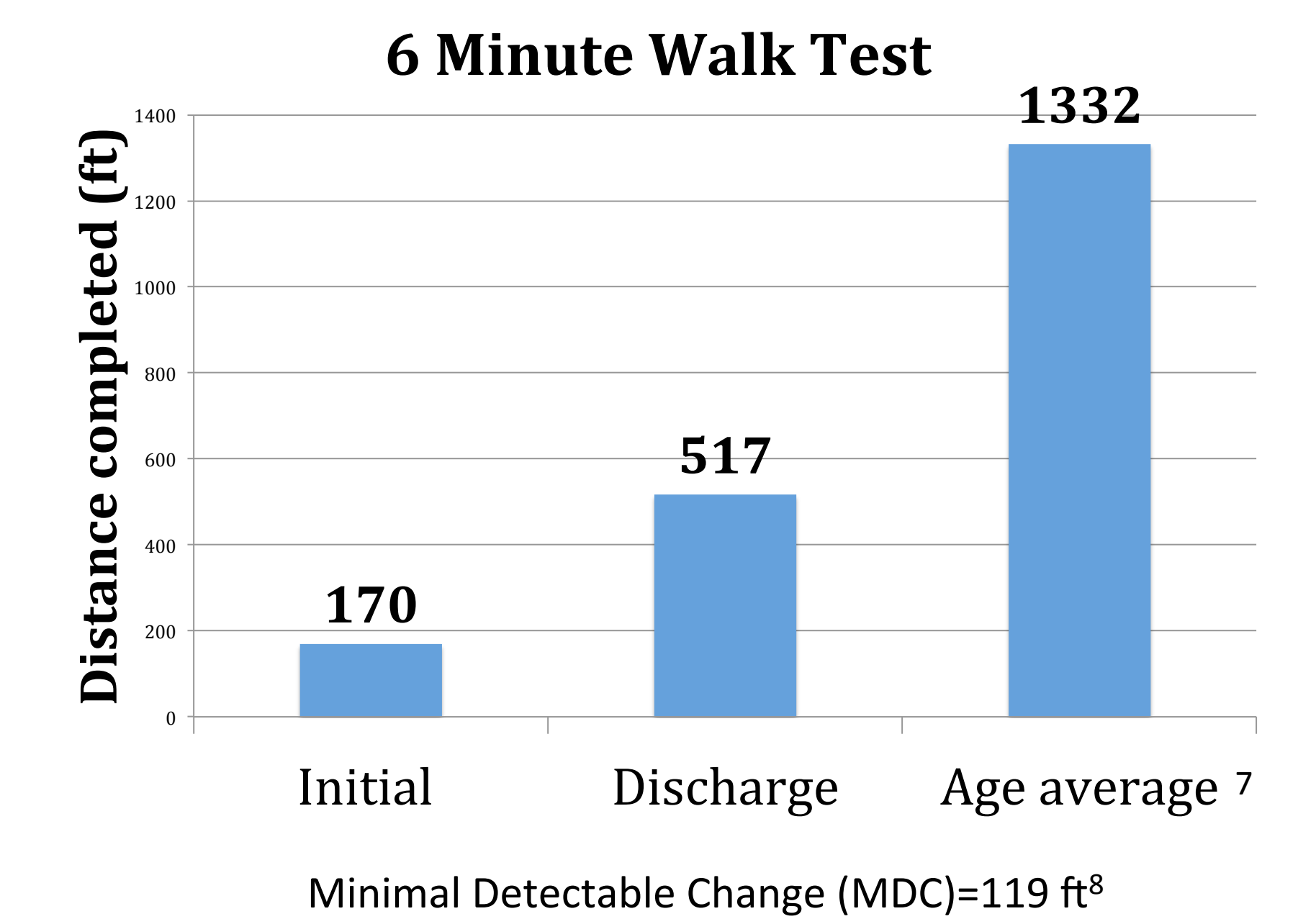
Interventions

Intervention	Purpose
Gait training	Promote improvements in gait parameters, muscle strength, and postural stability. ^{3,4}
Lower Extremity Strengthening	Increase lower extremity strength for functional tasks, promote improvements in gait parameters, muscle strength, and postural stability. ^{3,4}
Transfer Training	Promote safe independence during transfers from varying surfaces to promote carryover to home.
Activity Tolerance Training	Increase patient's activity tolerance to allow ambulation without shortness of breath. Promote improvements in gait parameters, muscle strength, and postural stability. ^{3,4}
Standing Tolerance Training	Promote safe, independent, and good static standing balance to aid patient in completion of ADLs and aid in balance training.
Balance Training	To promote improvements in balance to decrease future fall risk, and to challenge postural sway to promote compensation mechanisms. ⁵
Stair Training	To promote safe discharge home, and decrease resting and exercising heart rates, rate of perceived exertion, and increase dynamic standing balance. ⁶

Intervention	Rx Week One	Rx Week Two
Gait Training	RW and CGA	4WW and distant supervision
Transfer Training	Min assist x 1	Distant supervision
Stair Training	Not addressed	B/L UE support, CGA U/L UE support, CGA U/L UE support, distant S

Key: RW= rolling walker; CGA= contact guard assist; 4WW= four wheeled walker, rollator; B/L= bilateral, U/L= unilateral

Outcomes



Discussion

Multiple studies have been completed that demonstrate the long lasting effects of cancer treatment on functional mobility, especially fall risk, but few demonstrate ways to mitigate the decline. According to a study by Huang et al², muscle weakness and difficulty with balance and walking have been linked to increased falls in cancer survivors. **With the interventions provided, the patient showed improvements in functional mobility, balance and lower extremity strength, as well as improved cardiovascular endurance and fall risk as assessed by the 6-MWT and BBS respectively .**

Resources and Acknowledgments

- Howlander N, Noone AM, Krapcho M, Garshell J, Miller D, Altekruse SF, Kosary CL, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA. SEER Cancer Statistic Review, 1975-2012. National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2012/. Based on November 2014 SEER data submission, posted to the SEER website, April 2015.
- Huang M, Lytle T, Miller K, Smith K, Fredrickson K. History of falls, balance performance, and quality of life in older cancer survivors. *Gait & Posture*. July 2014;40(3):451-456. Available from: MEDLINE, Ipswich, MA. Accessed June 27, 2015.
- Chen MS, Lin TC, Jiang BC. Aerobic and resistance exercise training program intervention for enhancing gait function in elderly and chronically ill Taiwanese patients. *Public Health*. 2015; <http://dx.doi.org/10.1186/s10803-015-04018-4>
- Park JMS, Jeongsook L, Jeongok Y, Bomjinn L, Dongwook H. Effects of combined exercise on changes of lower extremity muscle activation during walking in older women. *J Phys Ther Sci*. May 2015;27(5):1515-1518.
- Tanaka H, Uetake T. Characteristics of postural sway in older adults standing on a soft surface. *J Hum Ergol (Tokyo)*. December 2005;34(1-2):35-40
- Donath L, Faude O, Roth R, Zahner L. Effects of stair-climbing on balance, gait, strength, resting heart rate, and submaximal endurance in healthy seniors. *Scand J Med Sci Sports*. 2014;24(2):193-201.
- Lusardi M. Functional Performance in Community Living Older Adults. *Journal of Geriatric Physical Therapy*. 2003;26(3):14-22.
- Perera S, Mody S, et al. Meaningful change and responsiveness in common physical performance measures in older adults. *J Am Geriatr Soc*. 2006; 54(5): 743-749.
- Donoghue D, Stokes EK. How much change is true change? The minimum detectable change of the Berg Balance scale in elderly people. *J Rehabil Med*. 2009;41(5): 343-346.

The author acknowledges Brian Swanson, PT, DSc, OCS, FAAOMPT, for assistance with case report conceptualization and Jennie L. Spaulding, PT, DPT for supervision.

Contact information: kokelly@une.edu, University of New England, 716 Stevens Ave, Portland, ME 04103