



An Exercise in Reality: Applying the WHO Physical Activity Guidelines for Persons with Complex Conditions

by Mike Studer, PT

Editor's Note: This case study is published in advance of the September 21, 2021 Journal Club webinar and accompanies the article: Are the Recommended Physical Activity Guidelines Practical and Realistic for Older People With Complex Medical Issues?. These case studies are intended to demystify the more formal statistics and format of a peer-reviewed article and translate key concepts into clinically usable information. Join us for Journal Club on the third Tuesdays of January, March, May, July, September and November at 8 pm ET to discuss current concepts with a wide range of peers.

"Movement is the commonality of life..." – Mrs. Kvarsten

Levinger and Hill¹ addressed the need for modifications to the World Health Organization (WHO) physical activity (PA) guidelines in their 2021 article entitled, "Are the Recommended Physical Activity Guidelines Practical and Realistic for Older People with Complex Medical Issues?" published in the *Journal of Geriatric Physical Therapy*. The PA guidelines include 150 minutes of moderate-intensity or 75 minutes of high-intensity activity per week. In this case study, we will explore the application of these guidelines, without modification, for a 91-year-old individual with a complex medical history and recent frailty.

Subjective examination/Primary complaint: Mrs. Kvarsten is a 91-year-old female referred to outpatient physical therapy for management of her functional mobility that can best be summarized as severe deconditioning and frailty, with concomitant elevated fear and fall risk. Her medical diagnoses for this plan of care include chronic low back pain, Charcot-Marie Tooth (CMT) neu-

ropathy, arrhythmia, congestive heart failure (CHF), pneumonia, deep venous thrombosis (DVT), frequent falls. The patient clarifies that she has experienced² "bad falls" this year and 3-4 more near falls (losses of balance without change in level). Although she never tested positive for Coronavirus, there are several points in her medical care that indicate (as she relays) this testing was simply not conducted.

As we understand the importance of listening to our patients, Mrs. Kvarsten's description of her medical course follows, "About a year ago, I took a fall when I was cleaning my house and tripped over some stacks of papers. I fractured a rib. Then, I came down with a bronchial-type of damage, to the point that I had to go to the hospital. I was not getting better. My feet were like footballs. I had extreme swelling. The doctor put me on a 2 week monitor that had to be sent to California...so that took 3 weeks. They determined that I was in cardiac arrhythmia the whole time. I needed a cardiac angioplasty. That did not help. So, then they decided that I needed an

Table 1. Current medications

- Acetaminophen 325mg – 3-4 at night for sleep
- Alpha lipoic acid 600mg, daily for CMT
- Vitamin C 500mg
- Calcium Citrate 1000mg 1 every other day
- Captopril 12.5mg 2x/day for CHF
- Co-Q10 100mg
- Cod liver oil 1000mg
- Eliquis 2.5 tab morning/night – prophylactic for DVT
- Probiotic Citrucel 1 evening
- Furosemide 40mg BID for CHF
- Losartan 25mg morning for blood pressure/CHF
- Multivitamin: Centrum, daily
- Potassium Chloride daily
- Pravastatin 20mg daily
- Vitamin D 2000 morning
- Vitamin E 200mg daily

Table 2. Initial Evaluation

Test Score

Montreal Cognitive Assessment	26/30
Activities-Specific Balance Confidence Scale	15.6%
2 Minute Walk Test (2MWT)	228'
30 second sit to stand (30SSTS)	4
Four Stage Balance Test (FSBT)	1



without fear at all". She adds a goal of "getting outside and working"; this was a recurrent theme in her interview. Finally, Mrs. Kvarsten elaborates, "I belong outdoors. Moving outdoors. Movement is the commonality of life. Even the driest of the trees moves in the wind, until it dies."

Sleep: Mrs. Kvarsten reports that her sleep is disturbed by pain to some degree on most nights. As noted in her medication list, she uses acetaminophen to dull the pain and reports getting 6-8 hours of sleep with 1-2 wakeful periods to urinate, nightly.

Objective Examination at Initial Evaluation/ Cognitive Screen: Mrs. Kvarsten is A+O x3. Her vital signs at rest were recorded as follows: heart rate (HR) 70 bpm, blood

ablation. That did not help much, either. I have been struggling as to what I can do. I have been sedentary for a year. My doctors said, "Your muscles have deteriorated. Your heart will get better if your body gets exercise."

Medical history and current medications: Charcot Marie Tooth (CMT) with bilateral (B) involvement, B knee osteoarthritis with 2 previous arthroscopic surgeries on her R knee, chronic low back pain (LBP), right quadriceps sartorius muscle (mm) tumor (sarcoma) excised in 2005, intercranial hemorrhage (ICH) with craniotomy (2008) due to ruptured aneurysm. She has age-related hearing loss and does not wear hearing aids. Her fall history is significant for 2 falls this year (past 6 months) as noted above.

Home environment and current level of function: Mrs. Kvarsten is widowed. She lives with her 31-year-old grandson in a multi-story home on her farm. Her bedroom is on the second level. She frequently finds herself sleeping in her recliner chair due both to effort to ascend the stairs and back pain in most sleeping positions. This patient's support system includes a local daughter, the referenced grandson, and an adoptive granddaughter. All of her supports work outside the home on variable schedules and are not consistently available for transportation. Hiring transport by service or taxi can be cost prohibitive due to the distance from her home to city center, making the recommended frequency of therapy prohibitive when combined with medical visits. The patient states her goals as, "...getting around the house without help and I guess

pressure (BP) 148/89, percentage of oxygen saturation in the bloodstream (SpO2) 96%, and respiration rate (RR) 12/min. The patient scored a 26/30 on the Montreal Cognitive Assessment (losing 2 points on delayed recall and 2 points in the category of attention). The patient scored 15.6% on the Activities-Specific Balance Confidence Scale. Her functional examination included, in order: 2 Minute Walk Test (2MWT); 30 second sit to stand (30SSTS); and the Four Stage Balance Test (FSBT). Results of all tests are included in Table 2. Her response to the 2MWT was very informative, including her physiologic response expressed through change in vital signs to 92bpm, BP 170/89, SpO2 94%, and RR 20/min. The patient ambulates independently using a single point cane (SPC), relying on it heavily throughout the test. She expressed her perceived exertion on the modified BORG (0-10) as 8/10; she was allowed to recover for 2 minutes. She did not express pain provoked by the test and ambulated 228'. In consideration of energy conservation, the patient was only screened for flexibility and functional assessments served as her initial strength metrics. Additional functional measures including the Timed Up and Go as well as more comprehensive balance batteries (Berg or BEST) were deferred.

Assessment: Mrs. Kvarsten presents as a person with very high fall risk, elevated primarily because of her multifactorial loss of strength, power, and endurance. These increase her already elevated fall risk due to severe

CMT. Despite this, she finds enjoyment in life and the longevity that she is experiencing. She is well-motivated and understands that our exercise prescription for her includes 80 minutes the first week, then up to 115, and finally 150 minutes at moderate intensity/week by the end of 3 weeks. She verbalizes that this level of activity is to be held and maintained. She expresses an understanding that her outcomes of fall frequency, perceived fatigue, shortness of breath, and reduced independence should all be responsive to these efforts.

Based on this assessment, Mrs. Kvarsten would benefit from 2x/week skilled physical therapy to improve her fitness (cardiopulmonary, muscular endurance, strength), maximize functional mobility, improve ADL function, and decrease fall risk. She will also benefit from the prescrip-

tion of a home exercise program to achieve the recommended minutes of activity based on the WHO levels of 150 minutes of moderate activity per week or 75 minutes of high intensity activity per week (hereafter abbreviated as 150/75). On initial examination, the patient was educated on the WHO recommendations and their role to complement the clinical plan of care. She participated in and agreed with some discussion about the relevance and application for persons of her age with her medical conditions.

Plan: Mrs. Kvarsten will receive 1-2x/ week outpatient services for 6-8 weeks prior to reassessment. Treatment sessions will include endurance, balance, and strength elements using the treatment environment of her preference, aquatics, and most specifically – an underwater treadmill. It should be clearly stated that the skilled PT sessions are only a part of the stated plan of care for this patient, as she is fully aware that these sessions account for 70 minutes of her weekly planned 150 minutes of moderate-intensity exercise. This exercise program is detailed below, in Table 2, with focus on fitness as an intervention to reduce many of her physiologic impairments and functional limitations.

In an intermediate phone-call check-up 2 weeks after the initial examination, the patient admitted to 30-40% compliance with her HEP. She noted, "The sit to stands...I have to use my hands. The walking is tough, it has been so hot.' She has been attending the 2x/week skilled PT visits, with a majority of the time spent on the underwater treadmill. The patient adds, "I feel like a different person. I am breathing better. My ankles are not as swollen. My oximeter shows good numbers, and my blood pressure is doing better (151/83) I would like to see it consistently under 140 (systolic)."

Discussion: In their article on modifying the physical activity guidelines for persons with complex medical histories, Levinger and Hill¹ suggest a relaxed guideline for persons that are medically complex. In this case, we demonstrate how a minute of moderate intensity activity for a person that is fit, is still 60 seconds. That minute of exertion lasts just as long as a minute for a person that is frail. The overall calorie expenditure and work accomplished would and should not be equal across all populations; a perceived exertion rate and a total of minutes per week can be the equalizing metrics. The WHO PA guidelines are not based on steps per day or calories spent; they should not be. While research clearly informs us that the brain and body benefit from exercise, we must recognize in the end that we are talking about people, not isolated body systems in a vacuum. Physical therapists must also understand that the brain and body are inseparable. Where one goes, so goes the other. This is evidenced in the brain's elation from endorphins after productive exertion, to the physiologic effects imposing limits on what the body is capable of when subdued by



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We will discuss **Are the Recommended Physical Activity Guidelines Practical and Realistic for Older People With Complex Medical Issues?** Pazit Levinger; Keith D Hill. J Geriatr Phys Ther. 2021 Jan/Mar 01;44(1):2-8

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major depression. Activity must be our focus, not exercise for the sake of fitness. This may never be more evident than in the frail and complex patient as reported in this case.²

Mrs. Kvarsten's PT sessions are engaging for her. She loves the aquatic training environment; this activity is verbally tied to her goals of working on the farm. At this trajectory, she will soon have the capacity to meet her goals of being outdoors and contributing to tasks that her farm needs her for. When she does begin work outdoors, those minutes will count as activity, as exercise, and as a psychological boost. For the most complex and frail person to contribute to a family, a project, or a parcel of land, PTs understand that both the body and mind can benefit. After all, it is not much of a tweak to the old dairy council advertisement to say: "Work, it does a body good."

References

1. Levinger P, Hill KD. Are the Recommended Physical Activity Guidelines Practical and Realistic for Older People With Complex Medical Issues? *J Geriatr Phys Ther.* 2021;44(1):2-8. doi:10.1519/JPT.0000000000000291
2. Studer M. Invited Clinical Commentary On: Are the Recommended Physical Activity Guidelines Practical and Realistic for Older People With Complex Medical Issues? *J Geriatr Phys Ther.* 2021;44(2):70-73. doi:10.1519/JPT.0000000000000297



Mike Studer, PT, MHS, NCS, CEEAA, CWT, CSST received his physical therapy degree from the University of Missouri-Columbia in 1991. He received his post-professional MHS degree in physical therapy with neurologic emphasis from the University of Indianapolis and his transitional DPT from the College of St. Scholastica in 2021. He has been board-certified as a Clinical Specialist in Neurologic Physical Therapy since 1995 and

has been designated a Certified Exercise Expert in the Aging Adult (CEEAA) since 2011. Mike has served as the Vice-president of the Academy of Neurologic Physical Therapy of the APTA and has been the chair and vice-chair of several special interest groups at the national level in each of the Academies of Neurologic and Geriatric PT, including Balance and Falls, Stroke, and the Practice Committee in neurology. He is a full-time treating therapist at and founder of Northwest Rehabilitation Associates, in Oregon. Studer has presented courses and published articles on neurologic and geriatric rehabilitation since 1995 and has authored and co-authored over 30 articles on topics of neurology and geriatrics, as well as several book chapters on stroke, PD, and preventative care as well. To date, Mr. Studer has presented in 9 different countries and 48 states on the topics of balance, motor control, motor learning, cognitive impairment and case management. He was awarded the Mercedes Weiss Service Award from the Oregon Chapter of the APTA in 2021, and in 2011 Clinician of the Year by the Academy of Neurologic Physical Therapy – a section of the American Physical Therapy Association. In 2014, Mike received the same award by the APTA Geriatrics – the first to receive this national distinction from each entity.

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