

Even A Little Can Be A Lot

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Editor's Note: This clinical case commentary was part of content for the July 2023 Journal Club. 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 p.m. ET to discuss current concepts with a wide range of peers.

Case study presentation based on the research article from Journal of Geriatric Physical Therapy: Billek-Sawhney B, Criss M, Galantino ML, Sawhney R. Wellness Aging Model Related to Inactivity, Illness, and Injury (WAMI-3): A Tool to Encourage Prevention in Practice. J Geriatr Phys Ther.2022;45(4):168-177.¹

When considering physical activity education and prescription for persons with a history of being inactive, clinicians may benefit from considering their word choices and approach. The following case study leverages the term physical activity. This highlights the difference between physical activity and exercise, which can be more subtle to health care practitioners, yet strikingly different to patients.

Caspersen and colleagues (1974) described physical activity as "any bodily movement produced by contraction of skeletal muscle that results in a substantial increase in energy expenditure." The authors went on to qualify that exercise is a behavior defined as a "planned, structured, and repetitive form of physical activity with the intention or goal of maintaining or improving one's fitness and/or health."^{2,3}

Paulette is a 76-year-old female referred to PT due to deconditioning from recent illness, her fear of falling, and her respiratory condition leading to reduced quality of life (QoL). She notes an unhealthy impression of and relationship with exercise for the entirety of her life. "I was never really athletic. I enjoy watching people in sports though." Paulette is retired from teaching, travel agency, and healthcare as a doula. She does enjoy traveling and expresses a concern over an upcoming trip with a very active friend to Rome. "I am not sure that I will be able to keep up with her," referring to her traveling companion's walking speed, endurance, and the number of days of sightseeing planned.

Paulette has 3 adult daughters and 7 grandchildren that she enjoys visiting, despite the long airport walks often associated with these trips.

PMH: Interstitial lung disease requiring supplemental O₂ at night, hiatal hernia, sleep apnea, OA with primary involvement in her hands bilaterally.

Pain: Generalized

Exam: [see Table 1]

Goals:

1. Walk for 20 minutes on level surfaces at self-selected pace without feeling shortness of breath.

2. Place 25# bag overhead (planes and train travel); pull for 1000' (airport).
3. Ascend and descend one flight of steps with railing, without feeling shortness of breath.
4. Reduce fear of falling When walking
5. Independently carry-out home program for endurance, strength, balance.

Interventions (initial clinic-based): 2x/week for 45-minute sessions

- Vital sign monitoring to start each session, including SpO₂
- Semi-recumbent elliptical warm-up at self-selected pace, 5 minutes (Options-treadmill, UBE, Semi-recumbent bike)
- HIIT treadmill training; LE press; computerized balance training (targeting CoP); uneven surface gait and stair climbing treadmill dosed at 125% of SSWS (2.2mph x 1.25 = 2.7mph) for initially :15 second intervals "on" and :45 seconds at 80% of SSWS (2.2mph x .8 = 1.8mph)

Interventions (initial home program): 4x/week for 144 total minutes/week

- Home program options, for Paulette to choose from throughout her week:
- 10x STS = 3.5 minutes/week
- HIIT stationary cycle by couch = 100 minutes/week (5x 20+)
- Wall push-ups = 5 minutes/week (patient choice of :30 seconds a total of 10x/wk)
- ½ mile walk 3x/wk = 12 minutes/bout = 36 minutes or 2.2mph
- Progression/personalization = adding 10% per week

Interventions (pt education, WAMI-3)

Paulette was most compelled by the visual depiction of the Wellness Aging Model Related to Inactivity, Illness, and Injury (WAMI-3).³ She felt that she could identify with each of the three I's in her present condition. She commented on each of the three I's, as follows:

Inactivity: "I know that I need to be more active. My kids and grandchildren tell me that. I read about it and

Table 1. Summary of Physical Therapy Exam

Outcome Measure	Result	Comment
Observation	Trendelenburg gait without device; frequently requires 2-3 attempts to rise to standing	
Physical Activity Vital Signs	See Table 2	
Gait Speed -self selected 10m Walk test	0.95 m/sec (Norm 1.2 m/sec)	
LE AROM	Unremarkable generally	Lacks 5 degrees B dorsiflexion
BLE STRENGTH	WNL generally Heel Raise Testing	B Hip Abd 3-/5
		B Plant Flex 3-/5
Dynamometer	28# RUE; 25# LUE	Inhibited B by thumb pain
30 Sec Chair Stand ⁵	7 (age/sex norm is 14)	Dyspnea
4 Stage Balance ⁵	Feet Together: 10s Semi-tandem: 8 s; Tandem 2s SOL: RLE 3 s; LLE 2 s	
2 MWT ⁶	388' (118m)	Age/sex norm 150 m
TUG	15.45 s	
TUB (Cog)	17.25 s	
BERG	46/56	
Geriatric Depression Scale-15	10	At cut-off likely depression ⁷
Fear of Falling Avoidance Behavior Questionnaire ⁸	42/56	See Figure 1
Orthostatic Assessment: Supine ⁵	BP 122/68; HR 76	After 5 min lying down
	SpO2 91%	
Orthostatic: 1 min Stand	BP 118/70; HR 78	
Orthostatic: 3 min stand	120/70; HR 80	No indication orthostasis

hear it on the news. Until I saw that I could improve and saw that it could be easy, convenient, and meaningful . . . I did not feel that I was convinced that it was for me.”

Illness: “No one really seems to know about my lung condition. No medications, surgery, or procedures. I am just supposed to keep coming back for imaging every so often. I thought that my shortness of breath was about that, and just concluded that my shortness of breath could not be improved.”

Injury: “I don’t understand why I am so fearful of falling. My mom fell a lot and did have some injuries, but I have never fallen. Still, it is on my mind so much of the time that I am sure that it affects how I move and if I move.”

Paulette additionally noted surprise by the notion that, “Replacing 30 min of sedentary time with light PA can reduce mortality by 20%.” With this improved understanding of how she could positively influence her health both short and long term, and the relative frictionless introduction to increase her physical activity, she felt engaged.

Reassessment

Three months after discharge from PT, she answered the Physical Activity Vital Sign questions again:

- “How many days a week do you engage in moderate to

strenuous exercise (like a brisk walk)?” – 4

- “On average, how many minutes per day do you exercise at this level?” – 25

Clearly, this was an improvement over her answers of “0” and “0” from the initial visit. Since starting PT, she had finalized the itinerary for her October trip to Rome and has mapped out several of the days’ walking. Notably, she is now routinely walking farther than the longest of days planned on her trip.

Discussion

To integrate the WAMI-3 model into clinical practice, physical therapists may position themselves for optimal success when they:

1. Understand the bio-psycho-social picture of a person
 - Biology/Physiologic tissue health and current level of fitness
 - Psychological: history with and expectations of exercise, preferences
 - Social: Environmental and cultural nudges, opportunities, and barriers
2. Create programs that include/ensure
 - Baseline measurements for short- and long-term accountability (program efficacy).

Figure 1. The Fear of Falling Behavior Avoidance Questionnaire⁸

Name: _____

Date: _____

Please answer the following questions that are related to your balance. For each statement, please check one box to say how the fear of falling has or has not affected you. If you do not currently do the activities in question, try and imagine how your fear of falling would affect your participation in these activities. If you normally use a walking aid to do these activities or hold on to someone, rate how your fear of falling would affect you as if you were not using these supports. If you have questions about answering any of these statements, please ask the questionnaire administrator.

Please check one box for each question

Due to my fear of falling, I avoid . . .	Completely disagree (0)	Disagree (1)	Unsure (2)	Agree (3)	Completely agree (4)
1. Walking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Lifting and carrying objects (eg, cup, child)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Going up and downstairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Walking on different surfaces (eg, grass, uneven ground)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Walking in crowded places	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Walking in dimly lit, unfamiliar places	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Leaving home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Getting in and out of a chair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Showering or bathing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Preparing meals (eg, planning, cooking, serving)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Doing housework (eg, cleaning, washing clothes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Work or volunteer work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Recreational and leisure activities (eg, play, sports, arts and culture, crafts, hobbies, socializing, traveling)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please make sure you have checked one box for each question. Thank you!

Total: /56

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- Early success without pandering.
 - Variety within personal preference to maintain engagement.
 - Test/measure selection with both clinical (sensitivity) and personal (salience) consideration.
3. Increase education, intensity of physical activity, and frequency of activity as indicated based on
- Tissue health with consideration for muscle, tendon, and bone response to stress.
 - Recovery from exertion to a next session or bout of activity. Unforeseen circumstances (greater or lesser tolerance, injury, success).

4. Understand that modes of education, patient motivations, and myths (surrounding physical activity)
- Are individual to a person and may not be the same values that a health care practitioner holds.
 - Some people WILL be motivated by gamification, numbers, competing against themselves, others in an exercise class, or age-adjusted norms. Some people can be motivated by loss aversion (a primary basis for the WAMI-3), averting losses normally associated with aging, as well as those deemed preventable (incurred through illness, injury, and inactivity). Some people are motivated to move only when their actions are purposeful, helping another person, group (family or otherwise), or community.

Clinicians may find it to be more helpful AND beneficial in the long run to start a severely inactive (or frail) client with an intensity and frequency below the recommended minutes, following the science of low intensity replacing sedentary minutes. When coupled with functional measures, this can be gamifying for the person to see unexpected gains. This can be additionally beneficial and warranted when one considers the concept of tissue management. From musculoskeletal tissue through tendons and finally bone density, it is when we start to stress any of these tissues significantly more than what they are trained to/accustomed-to, that people may incur injury that halts their forward progress altogether. This is written with consideration for our tendencies to underdose people with frailty and should be combined with a logical progression of home and clinic time and intensity, as indicated in this case study.

The WAMI-3 provides a visual depiction of loss aversion and an opportunity to take back some quality of life. Consistent with the invited commentaries, I find the model to be intuitive and of value in our PA communication efforts with patients of all ages and diagnoses.

Table 2. Physical Activity Vital Signs Paulette's Initial Responses

Physical activity vital sign: Ask all patients

How many days a week do you engage in moderate to strenuous exercise (like a brisk walk)?

- 0

On average, how many minutes per day do you exercise at this level?

- 0

Gauge willingness to exercise or increase physical activity level

What prevents you from being physically active or exercising?

- I don't know what to do OR I have a hard time getting myself to start exercise.

What will it take for you to increase your physical activity level or start (or increase) exercising?

- If I have a reasonable plan, and a structure for when to exercise, I think that I can follow it.

Gauge self-efficacy

On a scale of 0-10, how confident are you that you can complete the prescribed exercises and activities?

- 5/10

Progress visits: When patient returns for follow-up visits, assess adherence.

On a scale of 0-10, how well did you perform your prescribed exercises this last week?

- 0 = 0%, I did not perform any of the exercises and/or activities as prescribed
- 10 = 100%, I performed all exercises and/or activities as prescribed
- 9/10 completion

Adapted from Greenwood et al⁹

However, health care efforts may be more effectively pointed toward health span, rather than life span. This case study is not an appropriate forum to either elaborate on or to deliberate this point.

References

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