

Predicting & Preventing Functional Decline in Older Adults: Tools to Optimize Your Practice.

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Physiotherapy Alberta: Senior’s Mobility Toolkit¹.



**Healthy Aging:
Seniors’ Mobility
Toolkit for
Physiotherapists**



Scores for Risk of Mobility Loss

Tool	Cut Scores	Risk for	Modifiable Factors		
			ROM	Strength	Balance
10 MWT	< 0.8 m/s	Mobility impairment	X	X	X
	< 0.6 m/s	Poor health, limited function	X	X	X
Single Leg Stance	< 10 sec	Balance impairment		X	X
	< 5 sec	Significant risk: fall		X	X
Grip Strength	Men 26-32 hg	Decreased general body strength and physical performance, mobility limitation		X	
	Women 16-20 hg				
	Weath < 26 hg				
TUG	Both Men & Women N ≤ 10 sec	Decreased functional mobility, executive function	X	X	X
	≥ 13.5 sec - Fall Risk				
	≥ 15 sec - cog				
	≥ 14.5 sec - mental				
30 sec Chair Stand	< 8 reps	Mobility loss, endurance	X	X	

Objectives.

- ✓ Guide a conversation about the practical application of screening tools for predicting functional decline in a clinical setting.
- ✓ Discuss tools & their related evidence that can be incorporated into your daily practice tomorrow.

What is Healthy Aging?

“... a *life long process* of optimizing opportunities for improving and preserving health & physical, social and mental wellness, independence, quality of life and enhancing successful life-course transitions.”²

(2. Public Health Agency of Canada, 2014)

“The *process of developing and maintaining* the functional ability that allows people to be and do what they value.”³

(3. World Health Organization, 2015)

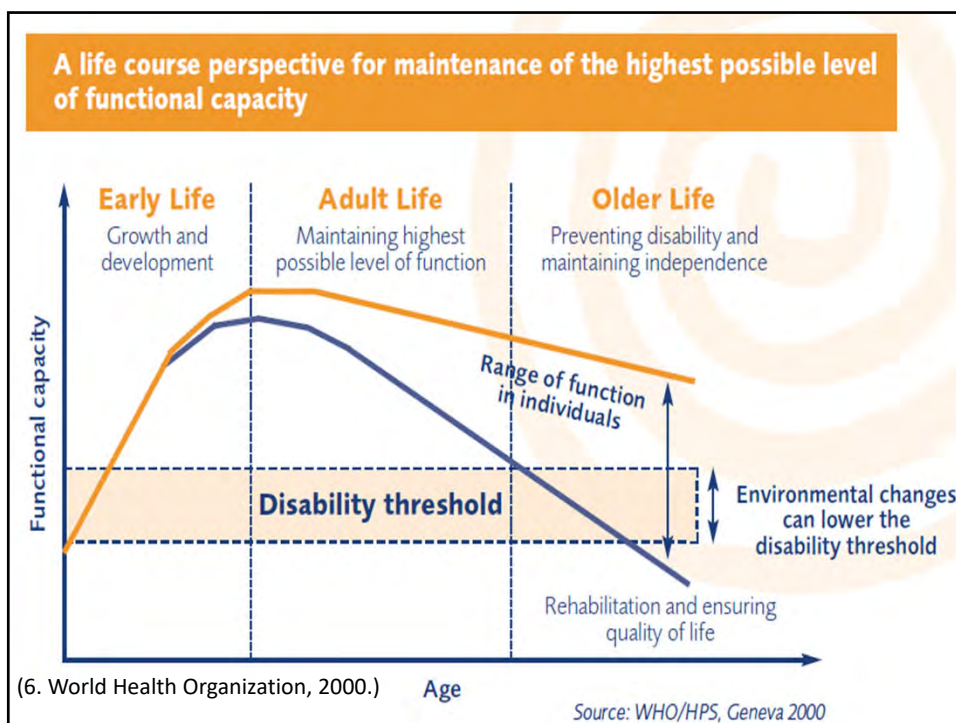
What is Functional Decline?

“... a *new loss* of physical or cognitive functions that impacts the ability to participate in ADL’s or IADL’s...” ⁴

(4. Vos et al, 2015)

“a *reduction* in ability to perform self-care activities of daily living (ADL) because of a decrement in physical or cognitive functioning.” ⁵

(5. Madden, 2016)



The Complexity of Functional Decline.⁷



(7. Beaton et al. 2014)

Assessment Tools¹

Selection of the Tools

- Inexpensive.
- Easy to use.
- Good psychometrics.
- Broad applicability.
- Familiar.
- Ax tools & Oms.



Assessment Tools: Challenges with Cut Scores

Challenges in Translating Research to Clinical Settings

- Variability in population.
- Variability in definitions + outcomes of interest.
- Variability in use of tool.



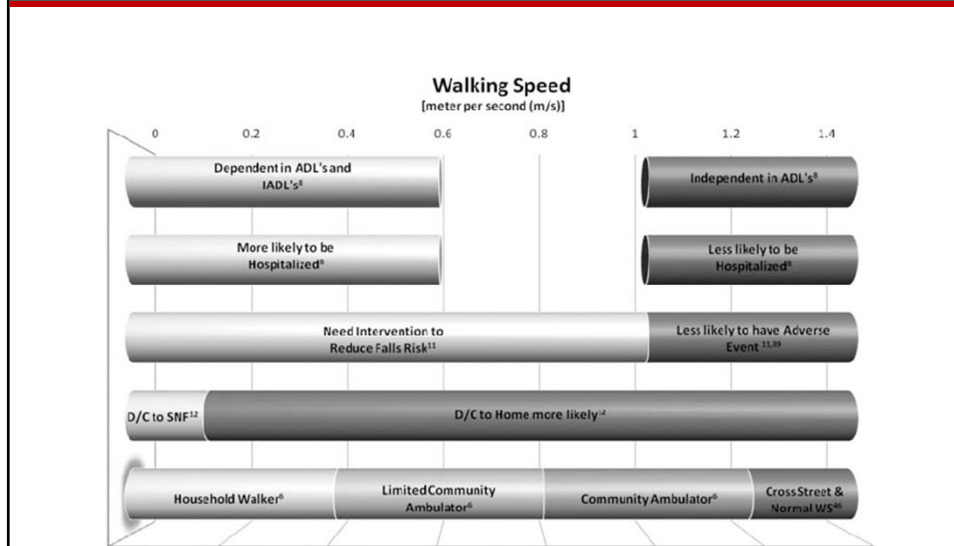
Assessment Tools ¹

Assessment Tools

- ✓ Functional Mobility
 - ✓ Gait Speed
- ✓ Strength
 - ✓ Grip Strength + STS 30
- ✓ Balance
 - ✓ Single Leg + BBS + miniBEST



Walking Speed: The 6th Vital Sign⁸



10 Meter Walk Testing Form 1

Name: _____

Assistive Device and/or Bracing Used: _____

Date: _____

Seconds to ambulate 10 meters (only the middle 6 meters are timed)

Self-Selected Velocity: Trial 1 _____ sec. Fast Velocity: Trial 1 _____ sec.

Self-Selected Velocity: Trial 2 _____ sec. Fast Velocity: Trial 2 _____ sec.

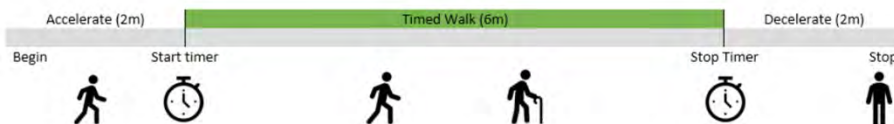
Self-Selected Velocity: Trial 3 _____ sec. Fast Velocity: Trial 3 _____ sec.

Self-Selected Velocity: Average time _____ sec. Fast Velocity: Average time _____ sec.

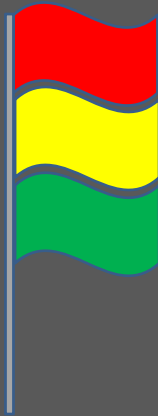
Actual velocity: Divide 6 by the average seconds

Average Self-Selected Velocity: _____ m/s

Average Fast-Velocity: _____ m/s



Walking Speed: Flags...⁹



<0.6 m/s = Danger, Red Flag

0.6ms/ - 1.0 m/s = Warning, Yellow Flag

>1.0 m/s = Community Ambulator

Grip Strength: Mobility limitation ¹⁰

Category	Cut Score (Kg)	Sensitivity	Specificity
Male (BMI > 25)	39	67%	71%
Male (BMI <_25)	33	73%	79%
Female	21	67%	73%



Grip Strength: Clinically Relevant Weakness ¹¹

Strength Category	Men	Women
Normal	>32 (greater than or equal to)	>20 (greater than or equal to)
Intermediate	26-32 kg	16-20 kg
Weak	<26 kg	<16 kg



Grip Strength: Flags...

Females	21kg or >	<21kg – 16kg	<16kg
Males	33kg or >	<33kg – 26kg	<26kg

30 Second Chair Stand ^{12, 13}

STS 30.

- What it is.
 - Quick & dirty L/E strength & function.
- How to do it.
 - Hands across chest, 30 seconds, 17"
- What it tells us.
 - Normative + Criterion-Referenced Standards for loss of functional independence.



30 Second Chair Stand Maintaining Physical Independence ¹²

	60-64	65-69	70-74	75-79	80-84	85-89	90+
Females	15	15	14	13	12	11	9
Males	17	16	15	14	13	11	9



Standing Balance ¹⁰

Assessment Tools

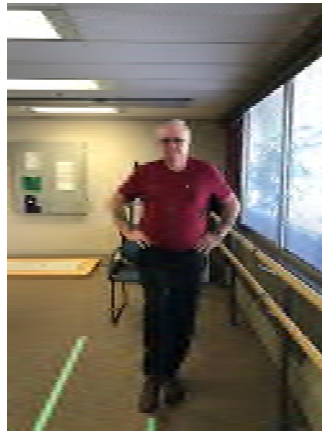
- Single Leg Stance Test
- Berg Balance Test
- MiniBEST Test

Single Leg Stance Test

Single Leg Stance Test.

- What it is.
 - The single easiest balance test you will ever do.
- How to do it.
 - Hands on hips, stand on one leg, 3 trials.
- What it tells us.
 - risk of balance impairment (< 10 sec)
 - Risk for falls (< 5 sec)

Single Leg Stance Test¹



Single Leg Stance Test (cont)

- Normative data up to age 99
- Parkinson's Disease*
 - Cut-off time of 10 seconds provided highest sensitivity and specificity for history of one or more falls

• Shirley Ryan Ability Lab

Berg Balance Scale

- What it is.
 - Oldest, well known balance test.
- How to do it.
 - 14 item test, with key for scoring, total 56 points.
- What it tells us.
 - Functional balance for lower functioning older adults.
 - Common language if you use this tool regularly.

Berg Balance Scale (cont)

Considerations

- Takes longer than screening tools.
- Instructions not as standardized as newer tools.
- Better measure of static balance than dynamic balance.
- Ceiling effect
- Not shown to predict fallers as well as originally thought¹⁴

MiniBEST

- What it is.
 - Shortened version of BESTest
- How to do it.
 - 14 item test, detailed key on scoring, videos on administration available on website:
 - <http://www.bestest.us/ind/miniBESTest/index/Task1.html>

MiniBEST (cont)

- What it tells us.
 - Measures four different balance systems
 - Anticipatory postural adjustments
 - **Reactive postural control**
 - Sensory orientation
 - Dynamic gait

MiniBEST¹⁵ (cont)

Considerations

- Designed to measure more components of balance, using test items felt to be “Best” from other tests
- More complex to administer than other functional balance tests, so observe video and practice!
- May not be the best test for clients with no or low English, low literacy level, or cognitive impairment

References

1. Physiotherapy Alberta: College + Association. Healthy Aging: Seniors' Mobility Toolkit for Physiotherapists. 2018. https://www.physiotherapyalberta.ca/xchange/continuing_professional_development/elearning_center/healthy_aging_seniors_mobility_toolkit/#mobility_in_healthy_aging
2. Public Health Agency of Canada . 2011 <http://www.phac-aspc.gc.ca/seniors-aines/publications/public/healthy-sante/vision/vision-bref/index-eng.php> (extracted Oct15, 2014).
3. World Health Organization – World Report on Ageing and Health. 2015. <http://who.int/ageing/events/world-report-2015-launch/en/>
4. Vos, J. et al. Integrated approach to prevent functional decline in hospitalized elderly: the Prevention and Reactivation Care Program (PRECaP). BMC Geriatrics. 2012. 12(7).
5. Madden, K. Defining Functional Decline, Characteristics of Admitted Older Adults and Comparing Alternate Versions of the MoCA. Can Geriatr J. 2016. Mar; 19(1): 2–8.
6. World Health Organization - The Implications for Training of embracing A Life Course Approach to Health. 2000. http://www.who.int/ageing/publications/lifecourse/alc_lifecourse_training_en.pdf
7. Beaton K, McEvoy C, Grimmer K. Identifying indicators of early functional decline in community dwelling older people: A review. Geriatr Gerontol Int. 2015. 15: 133-140.
8. Fritz S, Lusardi M. White Paper: Walking Speed: The Sixth Vital Sign. J Geriatr Phys Ther. 2015; 32(2):2-5.
9. Hunter S. Gait Speed as a Vital Sign in Geriatric Rehabilitation. Physiotherapy Alberta Webinar. 2015 November. https://www.physiotherapyalberta.ca/course_materials/gait_speed_nov_2015.pdf
10. Sallinen J, Stenholm S, et al. Hand Grip Strength Cut Points to Screen Older Persons At Risk of Mobility Limitations. J Am Geriatr Soc. 2010; 58 (9):1721-1726.
11. Alley D, Shardell M, et al. Grip Strength Cut Points for the Identification of Clinically Relevant Weakness. J Gerontol A Biol Sci Med Sci. 2014 (May 1); 69(5) 559-566.
12. Rikli R, Jones C. Development and validation of criterion-referenced clinically relevant fitness standards for maintaining physical independence in later years. Gerontologist. 2013 (April); 53(2): 255-267.
13. Rikli R, Jones C. Functional Fitness Normative Scores for Community Residing Older Adults Ages 60-94. Journal of Aging and Physical Activity. 1999; 7: 160-179.
14. Lima CA, Ricci NA, Nogueira EC, Perracini MR. The Berg Balance Scale as a Clinical Screening Tool to Predict Fall Risk in Older Adults: A Systematic Review. Physiotherapy 2018; 104:383-394.
15. Sibley, K.M., Howe, T., Lamb, S.E., Lord, S.R., Maki, B.E., Rose, DJ, Scott, V, Stathokostas, L, Straus, S.E., Jaglal, S.S. *Recommendations for a Core Outcome Set for Measuring Standing Balance in Adult Populations: A Consensus-Based Approach.* PLOS ONE | DOI:10.1371/journal.pone.0120568 March 13, 2015.