

Dare to be first.



6 Minute Walk Test for Adults with Lower-Limb Amputations

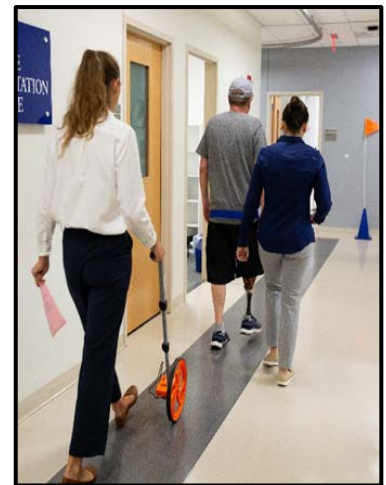
Description: The 6 Minute Walk Test (6MWT) is used to assess aerobic capacity¹ and walking function² in various populations. In patients with lower-limb amputations it can be used to assist with functional level classification³ and prediction of prosthesis nonuse at 1 year follow-up.⁴

Equipment: Stopwatch, rolling tape measure, long hallway or loop walkway, vital sign equipment

Patient Instructions: “This test assesses your walking capacity. Cover as much ground as possible in 6 minutes. While I want you to walk as fast possible, I want you to do so safely. You may rest at any point and sit if absolutely necessary, but the clock will not stop so please start walking again as soon as you are able. To avoid limiting your speed, we will refrain from conversation. I will give you time updates. [I will walk with you (if loop walkway or safety concerns)]. Begin.”

Clinician Instructions:⁵: Assess vital signs pre- and post-6MWT. Time the subject for 6 minutes, then say “stop.” Measure the distance walked. If repeating the test, use the same course as the baseline test as the number of turns may affect the distance walked.⁶ Patient may use assistive device if needed.

Do not perform if: systolic BP >180mmHg, diastolic BP>100mmHg, OR resting heart rate >120bpm.⁵



Procedure⁵:

Do	Do NOT
Walk behind the patient if using a loop hallway	Pace the patient if using a loop walkway (i.e. walk on their side)
Provide standardized encouragement every 30 seconds (i.e. “you’re doing great” or “you’re doing fine” or “keep going”) and notify patient of time remaining every minute (i.e. “5 min remaining”)	Converse with the patient other than to give standard encouragement, give time checkpoints, and to check symptom status.
Utilize a standard tone of voice	Use an excited tone as to “cheer” the patient on
Roll measurement wheel along the patient’s path & stop where he/she stops.	Roll the measurement wheel too close to the patient in case they stop suddenly

STOP testing based on the following criteria:

- Angina symptoms (chest pain or tightness)
- Any of the following symptoms:
 - Light-headedness
 - Confusion
 - Ataxia, staggering unsteadiness
 - Pallor
 - Cyanosis
 - Nausea
 - Marked dyspnea
 - Unusual fatigue
 - Signs of peripheral circulatory insufficiency
 - Claudication or other significant pain
 - Facial expressions signifying distress
- Abnormal cardiac responses
 - Systolic BP drops > 10 mmHg
 - Systolic BP rises to > 250 mmHg
 - Diastolic BP rises to > 120 mmHg
 - Heart rate drops more than 15 bpm (given patient was walking the last minutes of the test)

Notify physician if test is terminated for above reasons.

Predictive Ability: ≤191m predictive of prosthesis nonuse at 1 year post-discharge from rehab.⁴

Discriminant Validity:^{3,7}

Test-Retest Reliability: ICC (95% CI): .97 (.95-.99)⁸

Standard Error of Measurement: 20 m

Minimal Detectable Change (at 90% CI): 45 m

Longer-Term Prosthetic Users Reference Values (m) ³		
K-Level	Mean±SD	Range
K0-1 (n=18)	50±30	4-96
K2 (n=43)	190±111	16-480
K3 (n=67)	299±102	48-475
K4 (n=39)	419±86	264-624

Longer-Term Unilateral Prosthesis Users Reference Values (m) ⁹	
K-level	mean±SD (95% CI)
K3 (n=35; age: 60±12)	311±18 (273-349)
K4 (n=20; age: 46±12)	427±26 (373-481)

Outpatient Amputee Clinic Data Reference Values (m) ⁷	
K-level	mean±SD
K1-2 (n=30)	271±96
K3 (n=34)	408±82
K4 (n=22)	540±79
Amputation Cause	
Trauma/Congenital (n=45)	457±120
Dysvascular (n=21)	345±104
Diabetes (n=9)	256±122
Infection (n=6)	261±76
Cancer (n=5)	444±88
Sex	
Male (n=66)	400±43
Female (n=20)	373±106
Age	
< 50 years (n=23)	513±112
≥ 50 years (n=63)	350±115
Amputation Level	
Syme (n=4)	503±100
Transtibial (n=63)	383±136
Knee Disarticulate (n=3)	441±98
Transfemoral (n=13)	343±82
Bilateral Transtibial (n=3)	451±111

Average Distance Walked in Meters per Age Group for Able-Bodied, Community-Dwelling Older Adults ¹⁰							
Age	60-64 years	65-79 years	70-74 years	75-79 years	80-84 years	85-89 years	90-94 years
Female	474-628	427-611	411-590	361-569	315-529	271-507	211-441
Male	532-700	487-671	466-652	392-622	369-588	306-566	233-503

¹ Rikli R, Jones C. The reliability and validity of a 6-minute walk test as a measure of physical endurance in older adults. *J Aging Phys Act.* 1998;6:363-375. ²Harada ND, Chiu V, Stewart AL. Mobility-related function in older adults: assessment with a 6-minute walk test. *Arch Phys Med Rehabil.* 1999;80:837-841. ³Galley RS, Roach KE, Applegate EB, et al. The Amputee Mobility Predictor: an instrument to assess determinants of the lower-limb amputee’s ability to ambulate. *Arch Phys Med Rehabil.* 2002;83:613-627. ⁴Roffman CE, Buchanan J, Allison GT. Locomotor performance during rehabilitation of people with lower limb amputation and prosthetic nonuse 12 months after discharge. *Phys Ther.* 2016;96:985-994. ⁵American Thoracic Society. ATS statement: guidelines for the six-minute walk test. 2002. Available at: <https://www.thoracic.org/statements/resources/pfet/sixminute.pdf>. ⁶Orendurff MS, et al. The kinematics and kinetics of turning: limb asymmetries associated with walking a circular path. *Gait Posture.* 2006;23:106-111. ⁷Reid L, et al. Going places: does the two-minute walk test predict the six-minute walk test in lower extremity amputees? *J Rehabil Med.* 2015;47:256-261. ⁸Resnik L, et al. Reliability of outcome measures for people with lower-limb amputations: distinguishing true change from statistical error. *Phys Ther.* 2011;91:555-565. ⁹Sions JM, et al. Differences in physical performance measures among patients with unilateral lower-limb amputations classified as functional level K3 versus K4. *Arch Phys Med Rehabil.* 2018;99:1333-1341. ¹⁰Rikli R, Jones C. Functional fitness normative scores for community-residing older adults, ages 60-94. *J Aging Phys Act.* 1999;7:162-181.