Six-Minute Walk Test

American Thoracic Society (2002). Guidelines for the Six-Minute Walk Test. American Journal of Respiratory and Critical Care Medicine. 166:1, 111-117.

Description: The 6-Minute Walk test is a **sub maximal measure of aerobic capacity**. The person may use an ambulation aid and oxygen if they do so normally.

"The 6MWT is a useful measure of **functional capacity** targeted at people with at least moderately severe impairment. The test has been widely used for preoperative and postoperative evaluation and for measuring the response to therapeutic interventions for pulmonary and cardiac disease." (ATS, 2002)

Equipment: stethoscope, BP cuff, Borg RPE, dyspnea scale, stopwatch, tape measure, portable chair

Absolute contraindications:

- unstable angina during the previous month
- myocardial infarction during the previous month.

Relative contraindications:

- Resting HR > 120
- SBP > 180 mm Hg
- DBP > 100 mm Hg

Terminate exercise if:

Angina, light-headedness, confusion, ataxia, staggering unsteadiness, pallor, cyanosis, nausea, marked dyspnea, unusual fatigue, claudication or other significant pain, facial expressions signifying distress. Notify physician if test is terminated for any of the above reasons.

Instructions to the Participant:

"The object of this test is to **walk as far as possible** for 6 minutes. You will walk back and forth in this hallway. Six minutes is a long time to walk, so you will be exerting yourself. You will probably get out of breath or become exhausted. You are permitted to slow down, to stop, and to rest as necessary. You may lean against the wall while resting, but resume walking as soon as you are able.

You will be walking back and forth around the cones. You should pivot briskly around the cones and continue back the other way without hesitation. Now I'm going to show you. Please watch the way I turn without hesitation." (ATS, 2002) We will <u>avoid having a conversation</u> so that you can save your wind for walking. You can begin when I say 'go'.

Guidelines for the Tester:

Do not walk with the patient, however if balance is an issue, the tester may walk behind and to the side. After the first minute, tell the patient the following (in even tones): "You are doing well. You have 5 minutes to go." Repeat this message at every minute (4,3,2,1). Do not use other words of encouragement (or body language to speed up).

"If the patient stops walking during the test and needs a rest, say this: 'You can lean against the wall if you would like; then continue walking whenever you feel able.' Do not stop the timer. If the patient stops before the 6 minutes are up and refuses to continue (or you decide that they should not continue) ... the chair over for the patient to sit on, discontinue the walk, and note on the worksheet the distance, the time stopped, and the reason for stopping prematurely." (ATS, 2002)

At the end of the 6 minutes:

- Have participant sit down (portable chair)
- Immediately take vital signs, <u>starting with HR</u> (because it drops more quickly than SBP)
- Have patient rate their Borg Rate of Perceived Exertion (RPE), and dyspnea
- Calculate and record the distance walked.
- Ask: "What, if anything, kept you from walking farther?" (ATS, 2002)

<u>Safety:</u> Monitor vital signs before after the test. If there is an unexpected vital sign response, continue monitoring and documenting <u>every 5 minutes</u> until SBP and HR returns to within about 10-20 of pre-exercise values. Note heart rhythm, especially if it changes from a regular rhythm in pre-exercise to an irregular rhythm in post-exercise.

If participant has **congestive heart failure** profile (ankle edema, dyspnea at rest or with minimal exertion): auscultate the lung bases for new or increased crackles, and also auscultate the heart apically to see if you detect an S3 heart sound.

Aging of the Cardiovascular system:

- Resting HR in the elderly does not vary significantly from resting HR in normal, young population.
- In the elderly population, HR response to exercise can be less brisk, and also will not rise to as high of a maximal HR (compared to young normal),
- For the person with cardiac risk factors, if graded exercise stress test results are not available (the gold standard for establishing a target HR), keep the peak exercise HR under 120-130 bpm. Alternatively, only allow a HR rise of 20 bpm.
- If participant is taking a BETA BLOCKER it will blunt their HR response to exercise, therefore HR is not a reliable measure. Rely on RPE and dyspnea scales and their BP response.

Prognosis:

- Prediction formula for VO₂ Max: <u>Peak VO₂</u> = 0.03 x distance (in meters) + 3.98
- Cahalin L.P. (1996). The six minute walk test predicts peak oxygen uptake and survival in patients with advanced heart failure. Chest 110, 325-332
 CHF: 6MW distances of 300 meters (984') have both a poorer short term and long term survival rate.
- Bittner, V. (1993). Prediction of mortality and morbidity with a 6-minute walk test in patients with left ventricular dysfunction. JAMA 270: 1702-1707.

Norms for 6 Minute Walk Distances: 3 studies

Brown M. (unpublished). Exercise Specificity in Physical Frailty.

Mean age of frail elder participants: 84; Number of participants: n = 95

- Excluded subjects if scored > 30 on the Modified Physical Performance Test (mPPT)
- Also excluded if blind, dementia, progressive neurological disease

6 minute walk distance: Mean: 264 m., (865 ft.) SD: 95 m., (313 ft.)

Lusardi M. (2003). Functional Performance in Community Living Older Adults. Journal of Geriatric *Physical Therapy* 26;3;14-22 Participants: 76 (22 men, 54 women); mean age: 83 + 8

Exclusion criteria: unstable angina; cardiac event, cardiac surgery last 6 mo; use of O2 or inhalers; neuro disease

6 minute walk distances:				
Age	Gender (N)	Mean	SD	
60-69	Male (1)	498 m 1634 ft.	-	
	Female (5)	405 m 1329 ft.	110 m	
70-79	Male (9)	475 m 1558 ft.	93 m	
	Female (10)	406 m 1332 ft.	95 m	
80-89	Male (9)	320 m 1050 ft.	80 m	
	Female (24)	282 m 922 ft.	123 m	
	No Assist Device (24)	328 m 1076 ft.	102 m	
	Assist Device (9)	197 m 646 ft.	82 m	
90-101	Male (2)	296 m 971 ft.	15 m	
	Female (15)	261 m 856 ft.	81 m	
	No Assist Device (7)	324 m 1063 ft.	70 m	
	Assist Device (10)	224 m 735 ft.	51 m	

Steffen T.M. (2002). Age and Gender Related Test Performance in Community-Dwelling Elderly People: 6MW Test, BBS, TUG, and Gait Speed. *Physical Therapy*, Vol.82, No.2, Feb, 2002

- Subjects **included** needed to be able to walk 6 minutes without shortness of breath, chest pain, or joint pain in the legs, neck, or back that would limit 6MW.
- Subjects were **excluded** if: smokers, history of dizziness, used an assistive device

6 minute walk distances:					
Age	Gender (N)	Mean	SD	Normal Range (2SD)	
60-69	Male (15)	572m (1,877 ft.)	92 m	388-756 m	
	Female (22)	538 m (1.765 ft.)	92 m	354-722 m	
70-79	Male (14)	527 m (1.729 ft.)	85 m	357-697 m	
	Female (22)	471 m (1,545 ft.)	75 m	321-621 m	
80-89	Male (8)	417 m (1,368 ft.)	73 m	271-563 m	
	Female (15)	392 m (1.286 ft.)	85 m	222-562 m	