

Uitgebreide toelichting van het meetinstrument

6-Minute Walk Test (6MWT)

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1 Algemene gegevens

	Het meetinstrument heeft betrekking op de volgende categorieën
Lichaamsregio	Overige
Aandoening (ICD)	Bewegingsapparaat Zenuwstelsel en zintuigen Circulatie en ademhalingsstelsel
Domein 'Menselijk functioneren' (ICF)	Bewegingssysteem; Mobiliteit

- *Korte beschrijving* → De 6 minuten wandeltest wordt gebruikt om de functionele capaciteit te meten. Gemeten wordt de maximale afstand die de patiënt binnen 6 minuten kan afleggen. Het parcours kan 10, 30 of 50 meter zijn. De patiënt mag tijdens de test gebruik maken van een loophulpmiddel en/of orthese.¹ Van dit instrument is een originele en Parkinson-specifieke versie beschikbaar.
- *Doelgroep* → Volwassen en kinderen in het algemeen maar specifiek onderzocht bij respiratoire aandoeningen¹, cardiovasculaire aandoeningen¹, geriatrische patiënten¹, neurologische aandoeningen², totale heup en knie prothese³ en fibromyalgie⁴.
- *Auteur:*
 - ✓ *Oorspronkelijke versie* → ATS (2002)¹
 - ✓ *Nederlandse versie* → Takken T (2005)⁵

2 Doel van het meetinstrument

- Diagnostisch
- Prognostisch
- Evaluatief / effectiviteit
- Inventariserend

3 *Soort / vorm van het meetinstrument*

- Fysieke performance test
- *Opbouw* → De patiënt moet proberen een zo groot mogelijke afstand af te leggen in zes minuten. De therapeut meet de afgelegde loopafstand
- *Invulinstructie* → De patiënt wordt mondeling geïnstrueerd door de therapeut waarbij een zo groot mogelijke afstand wordt afgelegd in zes minuten.
- *Meetniveau* → Aantal afgelegde meters; meetniveau ratio

4 *Verkrijgbaarheid*

- *Opvraagbaar bij* → www.meetinstrumentenzorg.nl
- *Geschatte kosten* → gratis te downloaden
- *Copyright* → onbekend
- *App* → twee apps beschikbaar om de 6MWT af te nemen:
<https://www.beweegetech.nl/technologieen/6-minute-walk-test-marjolein/>
<https://www.beweegetech.nl/technologieen/6mwt-healthia-srl-marjolein/>

5 *Methodologische kwaliteit*

Informatie over de methodologische kwaliteit is terug te vinden in de volgende review(s):

Ouderen:

- Soubra R, Chkeir A, Novella J. A systematic review of thirty-one assessment tests to evaluate mobility in older adults. 2019⁶

Kinderen:

- Ammann-Reiffer C, Bastiaenen CHG, de Bie RA, van Hedel HJA. Measurement properties of gait-related outcomes in youth with neuromuscular diagnoses: a systematic review. 2014⁷
- Stephensen D, Drechsler WI, Scott OM. Outcome measures monitoring physical function in children with haemophilia: a systematic review. 2014⁸
- Mahaffey R, Morrison SC, Stephensen D, Drechsler WI. Clinical outcome measures for monitoring physical function in pediatric obesity: an integrative review. 2016⁹
- Pavão SL, Silva FPS, Dusing SC, Rocha NACF. Clinical tools designed to assess motor abilities in children with cerebral palsy. 2017¹⁰
- Scalco JC, Martins R, Keil PMR, Mayer AF, Schivinski CIS. Psychometric properties of functional capacity tests in children and adolescents: systematic review. 2018¹¹
- Lang RL, Stockton K, Wilson C, Russell TG, Johnston LM. Exercise testing for children with cystic fibrosis: a systematic review. 2020¹²

Gezonde volwassenen:

- Solway S, Brooks D, Lacasse Y, Thomas S. A qualitative systematic overview of the measurement properties of functional walk tests used in the cardiorespiratory domain. 2001¹³

- Mayorga-Vega D, Bocanegra-Parrilla R, Ornelas M, Viciano J. Criterion-related validity of the distance- and time-based walk/run field tests for estimating cardiorespiratory fitness: a systematic review and meta-analysis. 2016¹⁴

Oncologie:

- Granger CL, McDonald CF, Parry SM, Oliveira CC, Denehy L. Functional capacity, physical activity and muscle strength assessment of individuals with non-small cell lung cancer: a systematic review of instruments and their measurement properties. 2013¹⁵

Cardiovasculaire aandoeningen:

- Bellet RN, Adams L, Morris NR. The 6-minute walk test in outpatient cardiac rehabilitation: validity, reliability and responsiveness: a systematic review. 2012¹⁶
- Liu Y, Li H, Ding N, Wang N, Wen D. Functional status assessment of patients with COPD: a systematic review of performance-based measures and patient-reported measures. 2016¹⁷
- Oliveira AL, Marques AS. Outcome measures used in pulmonary rehabilitation in patients with acute exacerbation of chronic obstructive pulmonary disease: a systematic review. 2018¹⁸
- Holland A, et al. Home-based or remote exercise testing in chronic respiratory disease, during the COVID-19 pandemic and beyond: a rapid review. 2020¹⁹

Neurologie:

- Lam T, Noonan VK, Eng JJ. A systematic review of functional ambulation outcome measures in spinal cord injury. 2008²⁰
- Tyson S, Connell L. The psychometric properties and clinical utility of measures of walking and mobility in neurological conditions: a systematic review. 2009²¹
- Furlan JC, Noonan V, Singh A, Fehlings MG. Assessment of disability in patients with acute traumatic spinal cord injury: a systematic review of the literature. 2011²²
- Fox B, Henwood T, Keogh J, Neville C. Psychometric viability of measures of functional performance commonly used for people with dementia: a systematic review of measurement properties. 2016²³
- Bloem BR et al. Measurement instruments to assess posture, gait, and balance in Parkinson's disease: critique and recommendations. 2016²⁴
- Milne SC, Murphy A, Georgiou-Karistianis N, Yiu EM, Delatycki MB, Corben LA. Psychometric properties of outcome measures evaluating decline in gait in cerebellar ataxia: a systematic review. 2018²⁵
- Andreopoulou G, Mercer TH, van der Linden ML. Walking measures to evaluate assistive technology for foot drop in multiple sclerosis: a systematic review of psychometric properties. 2018²⁶
- de Valle K, McGinley JL, Woodcock I, Ryan MM, Dobson F. Measurement properties and utility of performance-based outcome measures of physical functioning in individuals with facioscapulohumeral dystrophy: a systematic review and evidence synthesis. 2019²⁷
- Bouça-Machado R, et al. Measurement instruments to assess functional mobility in Parkinson's Disease: a systematic review. 2019²⁸

Artrose/gewrichtsvervanging:

- Kroman SL, Roos EM, Bennell KL, Hinman RS, Dobson F. Measurement properties of performance-based outcome measures to assess physical

function in young and middle-aged people known to be at high risk of hip and/or knee osteoarthritis: a systematic review. 2014²⁹

- Reynaud V, Verdilos A, Pereira B, Boisgard S, Costes F, Coudeyre E. Core outcome measurement instruments for clinical trials of total knee arthroplasty: a systematic review. 2020³⁰

Amputatie:

- Hawkins EJ, Riddick W. Reliability, validity, and responsiveness of clinical performance-based outcome measures of walking for individuals with lower limb amputations: a systematic review. 2018³¹
- Balk EM, et al. Psychometric properties of functional, ambulatory, and quality of life instruments in lower limb amputees: a systematic review. 2019³²

Overig:

- Ratter J, Radlinger L, Lucas C. Several submaximal exercise tests are reliable, valid and acceptable in people with chronic pain, fibromyalgia or chronic fatigue: a systematic review. 2014³³
- Parry SM, Granger CL, Berney S, Jones J, Beach L, El-Ansary D, Koopman R, Denehy L. Assessment of impairment and activity limitations in the critically ill: a systematic review of measurement instruments and their clinimetric properties. 2015³⁴
- Symonds T, Campbell P, Randall JA. A review of muscle- and performance-based assessment instruments in DM1. 2017³⁵
- Song JZ, Catizzone M, Arbour-Nicitopoulos KP, Luong D, Perrier L, Bayley M, Munce SEP. Physical performance outcome measures used in exercise interventions for adults with childhood-onset disabilities: a scoping review. 2020³⁶
- Deuel de Oliveira Tavares V, et al. Reliability and validity of physical fitness tests in people with mental disorders: a systematic review and meta-analysis. 2021³⁷

6 **Hanteerbaarheid / feasibility**

- *Taal* → originele versie Engels¹, vertaling in Nederlands⁵
- *Benodigdheden* → stopwatch, twee pionnen, stoel, clipboard, saturatiemeter, bloeddrukmeter, telefoon, AED
- *Randvoorwaarden* →
 - Absolute contra indicaties zijn: onstabiele angina pectoris (afgelopen maand), myocard infarct (afgelopen maand).
 - Relatieve contra indicaties zijn: rusthartslag > 120, systolische bloeddruk >180 en een diastolische bloeddruk >100
 - Reden om 6MWT onmiddellijk te stoppen: pijn op de borst, ondragelijke benauwdheid, beenkrampen, duizelingen, extreem zweten, bleke of grijze gezichtskleur.
 - Als een patiënt zuurstof gebruikt mag hij/zij deze blijven gebruiken.
 - De test wordt op effen terrein afgenomen, bijvoorbeeld op een gang waar de patiënt voldoende ruimte (afhankelijk van gekozen afstand) heeft om te lopen en draaien en waar de gelopen afstand makkelijk gemeten kan worden. Als geen ruimte ter beschikking staat kan de test evt. ook buiten uitgevoerd worden.
- *Benodigde tijd* → ca 10 min (uitleg: 2 min, test: 6 min, afronding: 2 min)
- *Gebruikershandleiding* → ja, www.meetinstrumentenzorg.nl, gebaseerd op ATS¹ en Takken⁵

7 Normgegevens

Er zijn verschillende normwaarden in omloop. De meest gebruikte worden hier weergegeven. Welke van de onderstaande normwaarden gebruikt worden hangt af van de parcoursafstand waarop de test in de praktijk wordt afgenomen. De parcoursafstand en de manier van aanmoedigen moet overeenkomen.³⁸

10 meter parcoursafstand³⁹

- ATS-protocol gehanteerd
- De formule om de normwaarden te berekenen is:
 $\text{♂ } 6\text{MWT} = 1.266 - (7,80 * \text{leeftijd}) - (5,92 * \text{BMI})$
 $\text{♀ } 6\text{MWT} = 1.064 - (5,28 * \text{leeftijd}) - (6,55 * \text{BMI})$
- Uitbreiding van de formule met hartslagmeting (niet toepasbaar bij gebruik van bètablokker):
 $\text{♂ } 6\text{MWT} = 1.073 - (6,03 * \text{leeftijd}) - (5,79 * \text{BMI}) + (1,86 * \text{HRchange})$
 $\text{♀ } 6\text{MWT} = 878 - (3,60 * \text{leeftijd}) - (6,42 * \text{BMI}) + (1,95 * \text{HRchange})$

30 meter parcoursafstand⁴⁰

- ATS-protocol gehanteerd
- De formule om de normwaarden te berekenen is:
 $\text{♂ } 6\text{MWT} = (7,57 * \text{lengte [cm]}) - (5,02 * \text{leeftijd}) - (1,76 * \text{gewicht [kilogram]}) - 309 \text{ m}$
 $\text{♀ } 6\text{MWT} = (2,11 * \text{lengte [cm]}) - (2,29 * \text{gewicht [kilogram]}) - (5,78 * \text{leeftijd}) + 667 \text{ m}$

of

$$\text{♂ } 6\text{MWT} = 1.140 \text{ m} - (5,61 * \text{BMI}) - (6,94 * \text{leeftijd})$$

$$\text{♀ } 6\text{MWT} = 1.017 \text{ m} - (6,24 * \text{BMI}) - (5,83 * \text{leeftijd})$$

50 meter parcoursafstand⁴¹

- ATS-protocol gehanteerd, echter wel iedere 30 seconden aanmoediging gegeven.
- De formule om de normwaarden te berekenen is:
 $6\text{MWT} = 218 + (5,14 * \text{lengte [cm]}) - 5,32 * \text{leeftijd} - (1,80 * \text{gewicht}) + 51,31 * \text{geslacht. } (\text{♂}=1, \text{♀}=0)$

Zes minuten wandelafstand in meters, leeftijd in jaren, Body Mass Index (BMI) in kg/m², HRchange als verschil in hartslag in slagen per minuut (hartslag direct gemeten na de test minus de rusthartslag gemeten voor de test)

8 Overige gegevens

- Ziekte specifieke interpretatie:
 Artrose⁴²:
 - Hoe meer meters zijn afgelegd hoe beter het functioneren.
 - Klinisch relevant verschil is niet bekend bij heup- en knieartrose, maar is op basis van andere aandoeningen 25-50 meter.
 COPD⁴³:
 - <70% van de voorspelde waarde op basis van de normwaarde is onvoldoende. >70% van de voorspelde waarde op basis van de normwaarde is voldoende.

Reumatoïde artritis⁴⁴:

- Hoe meer meters er zijn afgelegd, hoe beter het functioneren.
- Klinisch relevant verschil is niet bekend bij reumatoïde artritis, maar is op basis van andere aandoeningen 25-50 meter.
- Het is niet aan te raden de 6MWT op een loopband of op een continue (rond of vierkant parcours) af te nemen omdat het de afgelegde afstand vergroot.^{45,46}

9 Literatuurlijst

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