

4 metre Walk Test (4mWT)

Measures gait speed and functional mobility.

Phases

Pre-op
Acute
Post-acute
Active living



ICF

Body function
Activity



Time

Approx. 5 mins to complete & score



Equipment

Walkway of 4m with additional 1m marked with tape at either end for acceleration and deceleration (6m total).



Quality



Validity

Criterion: No evidence found comparing 4mWT to instrumented or accelerometry-determined walking speed in knee/hip OA or TKA/THA.

Concurrent: TKA/THA: No evidence found comparing 4mWT to 10mWT. Healthy, older adults (mean age 84-yrs): the two tests did not exhibit a high enough degree of concurrent validity to be used interchangeably for gait speed assessments.¹

Convergent: TKA: The 4mWT (usual speed) is moderately correlated ($r=0.57$ to 0.75) with the 6MWT at all time points (pre-op, 1-mos, 2-mos, 3-mos, 6-mos and 1-yr).² TKA: The 4mWT (fastest) is moderately to fairly strongly correlated ($r=0.73-0.81$) with the 6MWT at all time points.² THA: No evidence found examining various types of validity.



Reliability

Test-retest: TKA: Good to excellent (ranging from ICC 0.79 at 1-yr post-op to ICC 0.87 at 2 & 3-mos post-op) for the self-paced 4mWT.² Lower extremity surgery (65% had THA or TKA): Excellent for the fast-paced 4mWT (ICC 0.94) at an unspecified time following surgery.³

TKA: Self-paced 4mWT is less responsiveness than the fast-paced test in the first 2-mos post-op; similar responsiveness is reported beyond 3-mos post-op when comparing standardized response means (SRMs).² For example, SRMs from 1-2-mos post-op were 0.76 (moderate) for self-paced & 0.91 (large) for fast-paced walking. After 3-mos post-op, the 4mWT is less responsive than the 6MWT.²

TKA: Pooling test distances ranging from 3.8-10m, self-paced walking speed increased from 0.96 m/s pre-operatively to 1.16 m/s 6-12-mos post-op with a plateau in improvement or slight decline in speed beyond 12-mos.⁴

THA: Based on varied test distances, a meta-analysis found small to large effect sizes in self-paced walking speed from pre-op to 6-wks post-op (SMD 0.32) & pre- to 12-mos post-op (SMD 1.28).⁵



Responsiveness



Floor/Ceiling Effects

No evidence found



Feasibility

Quick & simple with minimal equipment/space required.



Instructions

Instruct the patient to walk at their normal pace down a hallway or floor area through the 1m or 2m acceleration zone, a central 4m testing zone and a 1m or 2m deceleration zone. Patients may use an assistive device if needed.¹ For detailed instructions see 'Relevant Links'. Can also be performed at the patient's fastest pace.

Scoring: Time taken to walk 4m, recorded to 1/100th of a second, at either self-pace or fast-pace. Gait speed (converted to m per sec).



Interpretation

Direction: Fewer secs to walk set distance = better performance. This converts to faster walking speed (m/sec) over 4m distance.

Note: Values may be reported in secs or calculated as m/sec.

SEM: TKA: Small SEM ranging from 0.20 secs 3-mos post-op to 0.35 secs pre-op measured over 4m (usual pace).² Knee or hip OA: SEM ranges from 0.04 to 0.12m/sec for both self- & fast-paced walking over distances of 4-10m.³

MDC₉₅: TKA (usual speed): Ranged from 0.97 secs at pre-op to 0.58 secs at 1-yr follow-up.² TKA (fastest speed): Ranged from 0.58 secs at pre-op to 0.42 secs at 1-yr follow-up.²

Normative/ Reference values: See Bohannon et al⁶ for normative values (both usual & max. 4-meter gait speeds).

Cut points/thresholds: No evidence found

PASS: No evidence found



Other

Key messages: Provisionally recommended. Quick & easy to administer. Can be used as alternative to longer walk tests when space/time limited as correlates well with 6MWT in TJA population. Limited information on its responsiveness & ability to detect clinically meaningful change in TJA rehab. Recommended by European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO) working group for use in daily practice.⁷

Virtual administration: Chronic lower limb MSK disorders (mean age = 63 yrs): Virtual administration of the 5m fast paced walk has moderate test-retest reliability (ICC= 0.71), SEM of 0.55 secs, MDC of 1.52 secs & moderate agreement (ICC= 0.55) with in-person administration.⁸ Older adults (mean age = 69 yrs): Virtual administration of the 4mWT psychometric properties: a) moderate relative reliability for fast walking speed (ICC=0.62) and high reliability for normal walking speed (ICC=0.77), b) SEM of 0.11m/s (normal), and SEM of 0.22m/s (fast), and c) MDC of 0.30m/s (normal), and MDC of 0.61m/s (fast).⁹



Relevant Links

[Instructions \(BC Guidelines\)](#)

[Video \(NIH Toolbox\)](#)



References

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