

Functional Reach Test (FRT)

Measures static balance

Phases

Pre-op
Post-acute¹
Active living



Activity



~ 5 mins to
complete and score



Equipment

Tape measure or pre-measured intervals marked on wall at shoulder level



Quality



Validity

Predictive: THA: Pre-op FRT significantly associated (OR=1.13) with improved mobility (locomotive syndrome grade) 1-yr post-op.² **Concurrent:** TKA: Moderate association (r=0.70) with Berg Balance Scale 6-mos post-op.³ **Construct:** THA: Pre-op FRT weakly associated (correlation coefficient =0.188) with pre-op maximum gait speed.⁴



Reliability

Test-retest: TKA: Excellent (ICC=0.94) 6-mos post-op³; Hip OA: Insufficient test-retest or interrater (no raw data presented)⁵; Older nursing home residents: Excellent interrater (ICC=0.98) & good intrarater (ICC=0.75)⁶



Responsiveness

TJA or OA: Limited data on FRT's ability to detect change in TJA or OA populations. TKA: Significant, clinically important improvements in FRT at 8-wks (37.6 ±7.8cm) & 32-wks (39.3 ±9.7cm) post-TKA compared to pre-op (11.5 ±2.9cm).⁷ Post-TKA balance training on instrumented platform resulted in >10cm change in FRT.⁸



Floor/ceiling effects

No evidence found



Feasibility

Quick with minimal equipment/space required.



Instructions

Ask patient to stand close to, but not touching a wall & position the arm closer to wall at 90° flexion with a closed fist. Patient reaches as far forward as possible without taking a step. Position of 3rd metacarpal is recorded in cm/inches & compared to the starting position. See 'Relevant Links' for detailed instructions.

Scoring: Score based on difference between the start & end position, measured in cm. Record average of last two of three trials.



Interpretation

Direction: Higher score (greater distance) = better balance

SEM: TKA=1.79cm 6-mos post-op³; Hip OA: 3.43cm (2.73-4.61) or 12.7% which "limits the confidence in a measured value & usefulness in the clinical setting."⁵

Normative/ Reference values: Knee OA: systematic review found FRT ranged from 23-38cm & was 23cm (knee OA0 vs 29cm (healthy controls).⁹ Adults: Systematic review with meta-analysis found that FRT averaged 26.6cm (95% CI 25.14, 28.06) in community-dwelling adults vs. 15.4cm (95% CI 13.47, 17.42) for non-community dwelling older adults & starting at age 65-yrs, that FRT performance decreased 0.53 cm/year (95% CI⁰-0.85, -0.21).

MDC₉₅: TKA=4.95cm 6-mos post-op³



Interpretation (contd.)

MCID: Hip OA: MDC₉₀ was 8.0cm (95% CI 6.37, 10.76) or 29.6% between raters and 9.9cm (95% CI 7.85, 13.52) or 35% for test-retest⁵

Cut points/thresholds: Optimal cutoff for predicting falls in community dwelling older adults ranged from ≤18cm to 20.32cm. ⁶

PASS: No evidence found



Other

Key messages: Provisionally recommended. Limited evidence of validity, reliability and responsiveness in TJA populations – particularly THA. Clinically feasible.

A modified FRT can be performed with the patient in sitting.¹¹



Relevant Links

[Summary, instructions \(Physiopedia\)](#)

[Summary & instructions \(Shirley Ryan AbilitiesLab\)](#)

[Video \(Khoo Teck Puat Hospital\)](#)



References

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11. Shirley Ryan Abilitylab. Functional Reach Test/ Modified Functional Reach Test. Shirley Ryan Abilitylab. December 4 2013. Accessed August 9, 2022. <https://www.sralab.org/rehabilitation-measures/functional-reach-test-modified-functional-reach-test>

