

Exercise Therapy

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How do grade triceps surae based on Medical Research Council?

Muscle Group

Triceps surae: Gastrocnemius + Soleus

Function: Plantarflexion of ankle

Test Movement: Heel raise (plantarflexion)

As per the Daniels & Worthingham's Muscle Testing, Medical Research Council

Principle of Testing (MRC Scale)

Graded from 0 to 5 based on contraction, ROM, and resistance

Key progression: No contraction → Movement → Against gravity → Resistance

Standard method for clinical strength assessment (MRC, 1976; widely validated in neuromuscular research)

GRADE-WISE MRC GRADING (TRICEPS SURAE)

Grade 0 (Zero) – No contraction

Finding: No visible or palpable contraction

Testing Method: Patient prone or sitting Palpate Achilles tendon

Clinical Note: Indicates complete paralysis or severe nerve injury

Grade 1 (Trace) – Flicker

Finding: Minimal contraction felt, no movement

Testing Method: Palpate tendon during attempted plantarflexion

Clinical Significance: Early muscle activation without functional movement

Grade 2 (Poor) – Movement without gravity

Finding: Full ROM in gravity-eliminated position

Position: Side-lying or supine

Example: Ankle plantarflexion with foot supported

Grade 3 (Fair) – Against gravity

Finding: Full ROM against gravity

Testing Method: Patient standing

Protocol: Single heel raise

Clinical Note: Minimum level for functional gait push-off

Grade 4 (Good) – Moderate resistance

Finding: Full ROM against moderate resistance

Testing Method: Repeated heel raises

Protocol: 2–10 heel raises with control

Example: Standing heel raises without support

Grade 5 (Normal) – Full strength

Finding: Full ROM against maximal resistance

Testing Method: Repeated single-leg heel raises

Protocol: ≥20–25 repetitions without fatigue

Clinical Note: Indicates normal strength and endurance

STANDARD TESTING PROTOCOL

Position: Standing (Grades 3–5), gravity eliminated for Grades 2↓

Stabilization: Avoid knee flexion (to isolate gastrocnemius)

Movement: Heel raise (plantarflexion)

Repetitions used for grading:

<10 reps → Grade 4

≥20 reps → Grade 5

Supported by functional testing studies (e.g., Lunsford Bethany R. et al., 2003)

Readiness:

Ensure proper balance and support during testing

Compare bilaterally

Avoid substitution (toe flexion, trunk sway)

Maintain controlled movement

Reference: Kisner, Carolyn Therapeutic exercise: foundations and techniques / Carolyn Kisner, Lynn Allen Colby. — 5th ed.

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