Exercise Therapy

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Reeducation of elbow extensor from muscle power 0 to 5

Elbow Extensor Muscles Primary Triceps brachii Assisted by Anconeus (stabilization)

Principle of Re-education

Follow progressive activation → gravity-minimized → against gravity → resistance training, Functional recovery is considered effective when muscle strength reaches ≥

GRADE-WISE RE-EDUCATION PROTOCOL

Grade 0 (No contraction)

Goal: Initiate muscle activation

Intervention

Electrical stimulation (NMES) to triceps

Facilitation techniques: tapping, vibration, quick stretch

Mental imagery & biofeedback

Protocol

NMES: 10–15 min/session, 3–5 days/week

Position: Gravity-eliminated (supported arm)

Evidence

Electrical stimulation improves triceps activation and recovery in neurological conditions

Grade 1 (Trace contraction)

Goal: Enhance visible/palpable contraction

Intervention

Continue NMES + voluntary contraction attempts

Gravity-minimized positioning (supported elbow extension)

Active-assisted movement

Protocol

10–15 repetitions × 2–3 sets

Therapist assistance during extension

Key Point

Emphasis on neuromuscular re-education, not strength

Grade 2 (Full ROM in gravity-minimized)

Goal: Achieve full ROM without gravity

Intervention

Active exercises in gravity-eliminated plane

Use powder board / table slides

Begin isometric contractions

Protocol

10–15 reps × 2–3 sets

Isometrics: hold 5–10 sec × 5–10 reps

Example

Side-lying or supported sitting elbow extension

Evidence

Early rehab begins with low-load and controlled activation to allow tissue adaptation

Grade 3 (Full ROM against gravity)

Goal: Achieve antigravity movement

Intervention
Active ROM against gravity
Begin light resistance (manual or bands)
Functional training (reaching, pushing tasks)
Protocol
8–12 reps × 2–3 sets
Resistance: minimal (40–50% effort)
Example
Elbow extension in sitting (arm raised)
Wall push-ups
Clinical Note
Grade ≥3 indicates functional recovery milestone
Grade 4 (Moderate resistance)
Goal: Improve strength and control
Intervention
Progressive resisted exercises
Use Theraband, dumbbells, pulley systems
Begin eccentric training
Protocol
10–12 reps × 3 sets
Intensity: 50–70% 1RM
Example
Theraband elbow extension
Seated cable push
Evidence
Strength gains improve with progressive resistance training protocols (ACSM/NSCA guidelines)
Grade 5 (Normal strength)
Goal: Restore full strength, endurance, and function
Intervention
High-level resistance training
Functional & task-specific training
Plyometric / high-velocity exercises (if needed)
Protocol
8–12 reps × 3–4 sets
Intensity: 70–85% 1RM
Example
Push-ups, dips
Medicine ball throws
Evidence
Advanced rehab progresses to resisted and functional training phases for full recovery

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