

## Yoga after Stroke Leads to Multiple Physical Improvements

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**Objective:** Assess the impact of therapeutic-yoga on range of motion, strength, and walking capacity in people with chronic stroke.

**Methods:** Forty-seven individuals with chronic stroke were recruited and randomized 3:1 to yoga or waitlist control (usual care). The yoga group completed one hour yoga sessions twice a week for 8 weeks. Yoga was taught by a yoga therapist and included modified physical postures in seated, standing, and supine positions and included yoga breathing, bilateral movements, concluding with relaxation.

Assessments before and after the 8 weeks included: flexibility via passive range of motion (PROM) for the hamstrings (HS) and active range of motion (AROM) for hip flexion, cervical rotation, and cervical lateral flexion; strength with the chair to stand and arm curl and hip flexion manual muscle test; and walking capacity with the 6 minute walk test. We compared groups with a t-test/Mann Whitney. We used paired t-tests/Wilcoxon non-parametric tests to compare baseline and 8-week data.

**Results:** The average age of participants completing the study was 64, 76% were male, and 60% were white. There were no differences in demographics or outcomes between the yoga and control groups. There were no improvements in the waitlist control group (n=10). In the yoga group (n=37), improvements were found in flexibility with PROM and AROM, arm curl, and walking capacity, see below Table for data. The chair to stand test and hip flexion AROM did not change ( $p > .05$ ).

**Conclusion:** Research findings suggest therapeutic-yoga improved flexibility, arm strength, and walking capacity for individuals post-stroke. Such improvements may be related to improved quality of life. Therapeutic-yoga requires repetitive, slow and sustained muscle activation which may contribute to these findings. Further testing, however, is warranted as these findings are preliminary.

Physical measure	Baseline	8-weeks	P-value	% Change
Left Hamstring PROM	-22.20±9.8	-12.10±4.3	<0.001	46%
Right Hamstring PROM	-19.25±5.5	-12.20±4.4	<0.001	37%
Left Cervical Rotation AROM	54.45±8.3	65.85±8.2	<0.001	21%
Right Cervical Rotation AROM	57.65±8.9	65.55±8.0	0.002	14%
Left Cervical Lateral Flexion AROM	19.4±10	27.05±9.6	0.001	40%

Right Cervical Lateral Flexion AROM	15.4±8.8	23.8±8.3	<0.001	55%
Arm Curl Strength	13.76±4.1	15.4	0.003	12%
6-Min. Walk, Walking Capacity	869±380	949±370	0.002	9%

**3 key words:** Rehabilitation, yoga, stroke

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