

**Celik D. Comparison of the outcomes of two different exercise programs on frozen shoulder. Acta Orthop Traumatol Turc. 2010; 44(4):285-92.**

**Reviewer:** Linda Metzger 3-07-14

**Design:** Randomized controlled trial

**Objective:** To compare the effects of a glenohumeral ROM exercise program (control) to a scapulothoracic exercise program on pain, range of motion (ROM), and functional results in subjects with frozen shoulder.

**Reasons not to cite as evidence:**

- Several outcomes are reported: Visual Analog Scale (VAS) for pain, modified Constant Score, and three outcomes measuring range of motion (ROM) (external rotation, internal rotation, ROM of flexion), and two follow-up measurements: 6 and 12 weeks.
- The designation of a primary outcome was not clear.
- The author failed to report who performed the outcome measurements and if the assessor(s) was blinded to the treatment groups and the study's hypothesis. The outcome measurements would be at high risk of bias.
- Sample size was extremely small. The 2 groups included only 29 total participants.
- Baseline characteristics differed between the two groups. The scapulothoracic exercise group was on average 5 years younger than the control exercise group. The scapulothoracic exercise group had twice as many subjects that were diagnosed with secondary frozen shoulder, half as many diagnosed with primary frozen shoulder, and half as many affected by the dominant shoulder compared to the control exercise group.
- No information was provided on the group randomization process.
- No attempt was made to evaluate adherence to exercise performed at home and so compliance differences between groups could not be assessed.
- Both groups showed huge improvements in VAS scores, modified Constant score, and ROM at both the end of the intervention at 6 weeks and also at 12 weeks. Both exercise programs appear to be effective in reducing pain and increasing function in patients with frozen shoulder. The scapulothoracic exercise program included scapulothoracic strengthening and mobilization exercises to restore increased scapular protraction and external rotation, and stretching exercises for the shortened and contracted muscles, especially the upper trapezius in order to restore normal scapulothoracic rhythm. The regular exercise program included exercises and stretching to enhance glenohumeral ROM. Both groups carried out their exercises once a day, 5 times a week for 6 weeks in the clinic under the supervision of the physiotherapist. Some of the improvements seen may in part be attributed to the 30 supervised physiotherapy sessions that each patient received over a 6 week period.
- The author reported that using scapulothoracic exercises in addition to glenohumeral ROM exercises in the second group resulted in significant improvements in VAS at 6 weeks and flexion ROM at 12 weeks. The small VAS difference observed (1.5 points) between the groups was statistically significant, but was not clinically

significant and may have been due to the higher baseline VAS scores found in the scapulothoracic group.

- There were too many issues to make any evidence recommendations and the author's conclusions were also too weak for evidence.

**Interesting Observations:**

- The authors did report huge improvements on the Modified Constant Score for both groups in the range of 30 to 40 points over the 12 week period.