

**Bang MD, Deyle GD. Comparison of Supervised Exercise With and Without Manual Physical Therapy for Patients With Shoulder Impingement Syndrome. J Orthop Phys Ther 2000;30:126-137.**

Design: Randomized clinical trial

Study question: what are the comparative efficacies of supervised exercise physical therapy and supervised exercise combined with manual therapy in patients with shoulder impingement syndrome?

Population/sample size/setting:

- 52 patients (30 men, 22 women, mean age 43) treated for shoulder complaints at a Kaiser Permanente Medical Center in California and an army medical center in Texas
- Eligibility criteria, in addition to age 18-65, were based upon three categories of signs: impingement signs, active shoulder abduction, and “resisted break tests,” in which the examiner applied enough manual force to overcome the patient’s resistance and break the patient’s muscle contraction
- Exclusion criteria were changes in medication less than 2 weeks before the start of the study, any other form of treatment for shoulder pain during the study, pending litigation or workers’ compensation claim, history or physical exam suggestive of rotator cuff tear or adhesive capsulitis, history of shoulder dislocation or fracture, cervical spine pathology, history of cervical, shoulder, or upper back surgery, history of systemic or neurological disease, PT or chiropractic treatment to the shoulder, neck or back in the last 12 months, or lack of sufficient English skills to participate

Main outcome measures:

- Patients were randomized to a manual therapy group (n=28) or exercise (n=22)
- Both groups had a standardized flexibility and strengthening program in the clinic under the individual supervision of a physical therapist
- Both groups were seen in clinic for a total of 6 visits, one half-hour each, twice weekly for three weeks
- The exercise group had both a flexibility program (two passive stretching exercises) and a strengthening program (6 exercises, 4 of which used elastic tubing, one using a seated press-up, and one using an elbow pushup), at 6 levels of resistance, all exercises performed under the direct supervision of the physical therapist
- The manual therapy group had 6 sessions of manual treatment to increase physiological flexion or internal rotation and to enhance glenohumeral glide; the techniques included soft tissue massage and muscle stretching of the shoulder girdle musculature

- The manual group was instructed to do the exercise group's flexibility and strengthening program at home in order to make the session length equal to 30 minutes for each group
- Outcomes were based upon composite scores from three different items: (1) isometric strength tests measured by a dynamometer, (2) difficulty with nine separate activities (raising arm overhead, reaching across body, etc.) on a functional questionnaire of daily shoulder activities and (3) from visual analog scores (VAS pain during the nine daily activities, during active abduction, and during the examiner-performed "resisted break tests")
  - The isometric strength testing was done at baseline and was repeated after the final session of treatment
  - The functional questionnaire and visual analog scores were collected 60 days after the start of treatment, and were submitted by mail by the study participants to the researchers
- For all three outcome items, the manual therapy group had greater improvement than the exercise group
  - For isometric strength, the manual therapy group had higher scores at baseline than the exercise group had, but the manual therapy group improved its strength by 16% while the exercise group did not change
  - For the functional questionnaire, the two groups were equal at baseline, and both groups improved, the manual group by 35% and the exercise group by 17%
  - For the visual analog scores, the groups were equal at baseline, and both groups improved, the manual group by 70% and the exercise group by 35%

Authors' conclusions:

- Manual therapy combined with a home exercise program is more effective in improving pain, shoulder function, and strength than a similar exercise program under the direct supervision of a physical therapist
- Improvement in pain and function can be observed after relatively few physical therapy visits

Comments:

- Although the study was adequately randomized and had blinded assessment of outcomes by the testers (presumably those tests involving the dynamometer), there are some points of confusion in the rather convoluted presentation of procedures and results
  - Two outcomes, the functional assessment questionnaire and the functional visual analog scale, were supposedly submitted by mail to the researchers two months after the start of treatment

- However, some components of the functional visual analog scale, such as the “resisted break tests,” required the presence of an examiner to provide the force that overcame the patients’ resistance; this could not have been done by mail
- There “Treatment” section on page 129 states that “treatment for both groups consisted of a standardized flexibility and strengthening program that was performed in the clinic under the direct one-to-one supervision of a physical therapist. The manual therapy group additionally received manual physical therapy treatment directed at relevant movement limitations in the upper quarter”
  - This seems to imply that the manual therapy group had more time with the therapist than the exercise group had, if the supervised exercise component of each visit were to last 30 minutes and if there were to be additional time for the manual therapy component of each visit
  - However, in the end of the discussion section, it is said that “the exercise group performed the stretching exercises in the clinic while the manual therapy group performed them at home to allow time for the manual therapy treatment”
  - The best guess is likely to be that the manual therapy group had direct instruction in the exercise program early during the course of treatment and then was asked to continue the exercises at home
- The meaning of “significant disordinal time x group interactions” in the Results section for function and pain simply means that the lines cross in Figures 4 and 5, while “ordinal interaction for strength” refers to Figure 6, where the lines do not cross
- Although the manual therapy group did receive more hands-on time than the exercise group, this is not necessarily an indication of performance bias, if hands-on time is an important factor in improving function and reducing pain from impingement syndrome

Assessment: Adequate for some evidence that in the setting of shoulder impingement syndrome, a program of six half-hour sessions of manual therapy combined with a home stretching and strengthening exercise program is more effective than a program of six half-hour sessions of supervised performance of the same stretching and strengthening exercise program