Andersen CH, Andersen LL, et al. Dose-response of strengthening exercise for treatment of severe neck pain in women. J Strength Conditioning Research. 2013 in press

Design: Cluster randomized clinical trial

Summary of results:

- 118 women, mean age 42, participated in a cluster randomized trial of the effect of an exercise program on neck pain
- These 118 women were included within a larger study of 537 women in two workplaces in Copenhagen, most of whom did not have significant neck pain and were not analyzed in the current study
    - It appears that the majority of participants were enrolled in the study to examine the effect of an exercise training program on prevention of neck pain in the workplace
- Eligibility requirement was neck pain of at least 30 mm on a 100 mm VAS scale, defined by the authors as "severe" neck pain
- Exclusion criteria were hypertension, cardiovascular disease, symptomatic herniated disc or other severe disorder of the cervical spine, postoperative conditions in the neck and shoulder region, severe trauma, other serious disease, and pregnancy
- Participants were randomized to a workplace exercise program (n=69) or to a control group (n=49), which consisted of "usual care" with a promise that they would be able to participate in the exercise program after 20 weeks
- Exercise program was conducted in the workplace for up to one hour per week in three sessions weekly for 20 weeks; the maximum number of sessions was 60
    - Exercise training group performed specific training exercises for the neck and shoulder muscles, with half of the exercise sessions supervised by an instructor
- Adherence to the exercise program was ascertained both by self-report and by training logbooks kept in the workplace
    - The exercise training group was analyzed in three subgroups based on the degree of participation in the training sessions: 20 participants had low adherence (1-20 sessions), 25 had medium adherence (21-40 sessions), and 24 had high adherence (41-60 sessions)
- The exercise group had a mean VAS of 52 at baseline and decreases its VAS by a mean of 26 mm during training; the control group had a baseline VAS of 57 which decreased by 12 mm during the 20 weeks of observation

- The medium and high adherence groups had greater improvement in VAS (37 mm and 33 mm respectively) than the low adherence group (in Figure 2, appears to be about 4 mm)

Authors conclusions:

- There is a clinically relevant effect of resistance training for reducing severe neck pain in women, and there is a dose-response relationship between adherence and pain relief
- Differences in pain are not likely to account for the differences in adherence to exercise training, since there was no statistically significant difference in baseline pain between the three groups

Reasons for exclusion from evidence:

- The details of the cluster randomization are lacking, and the flow diagram does not clarify how it was done
- A previous publication (Zebris et al 2011) does not clarify this issue enough to make its interpretation straightforward; there appear to have been 14 strata based on "company, type of work task, and size of department" but it is not clear what a "department" is, nor whether the departments were sufficiently separated to avoid contamination, which is one of the principal reasons to conduct a cluster randomized trial
- In spite of the lack of a statistically significant difference in the three adherence groups for the baseline pain VAS, a causal dose-response effect is unwarranted
    - There may have been other factors present at baseline which were causal in influencing adherence to the exercise program
    - Figure 2 shows a large difference between the low adherence groups and the two other groups, but the high adherence bar graph is slightly lower than the medium adherence bar graph

Assessment: Inadequate for evidence of the effect of resistance training on neck pain

Reference:
Zebis MK, Andersen LL, et al. Implementation of neck/shoulder exercises for pain relief among industrial workers: A randomized controlled trial. BMC Musculoskeletal Disorders 2011, 12:205