

Kay TM, Gross A, et al. Exercises for mechanical neck disorders. Cochrane Database of Systematic Reviews 2012;Issue 8, Article # CD004250.

Reviewed no change to conclusions November 2016

Design: Meta-analysis of randomized clinical trials

PICOS:

- Patient population: Adults with acute (less than 30 days), subacute (30 to 90 days), and chronic (more than 90 days) neck pain with three categories
 - o Mechanical neck disorders (MND) including whiplash, myofascial pain, degenerative changes including osteoarthritis and cervical spondylosis
 - o Cervicogenic headache
 - o Neck disorders with radicular findings (NDR)
 - o Neck disorders with possible long tract signs (myelopathy), neck pain caused by other disorders, and non-cervicogenic headache studies were excluded
- Intervention: One or more type of exercise prescribed or performed for treatment of neck pain
 - o Studies in which exercise was part of a multidisciplinary treatment, and studies in which exercise required manual techniques (such as hold-relax techniques, passive techniques, and rhythmic stabilization) by a trained individual, were excluded
 - o 19 comparisons, some with up to 20 subgroups, were reported in total
- Comparison interventions: Exercise plus another intervention versus that same intervention (e.g., exercise plus manual therapy versus manual therapy without exercise), sham or placebo intervention, and no treatment wait list
- Outcomes: pain, function, patient satisfaction, and global perceived effect/quality of life; adverse effects were extracted when available
- Study types: only randomized controlled trials in any language
 - o Quasi-randomized trials were excluded

Study search and selection:

- Several databases were searched from their start through February 2012: MEDLINE, EMBASE, Manual Alternative and Natural Therapy (MANTIS), CINAHL, the Cochrane Central Register, the Cochrane Back Review Register, and the Index to Chiropractic Literature
- Two review authors independently selected and graded articles for inclusion; the reviewers had not authored any of the primary studies

- Five domains were considered for level of evidence: study design, risk of bias, consistency/inconsistency of results, directness (generalizability) of results, and precision/imprecision of results (sufficient vs. insufficient data)
- Quality of evidence ratings represent the judgment of the authors regarding the robustness of the results to the likely effects of new information from further research
 - High quality means that further research is very unlikely to change the confidence in the measure of effect, indicating that there is enough consistent data (75% of studies agreeing) with sufficient precision (narrow confidence intervals) and low risk of bias (all five domains are met)
 - Moderate quality means that further research is likely to have an important impact on confidence in the size of the effect and may change the estimate of effect (one of the domains is not met)
 - Low quality evidence means that further research is very likely to have an important impact on the estimate of effect and is likely to change that estimate (two domains are not met)
 - Very low quality evidence means that there is great uncertainty about the estimate of the effect (three domains are not met)
 - No evidence means that no RCTs were identified

Results:

- 21 trials met selection criteria
 - There were 2159 randomized patients and 2010 patients had their data analyzed
 - 19 studies evaluated neck pain
 - 1 study reported on neck pain with radicular signs and symptoms
 - 2 studies reported on cervicogenic headache
 - 1 study reported on acute radiculopathy
- No intervention met the authors' criteria for a high quality evidence statement
- Only four interventions met the criteria for a statement of moderate quality evidence
 - There was moderate evidence (4 trials, 341 patients) for moderate pain relief and improved function with long-term follow-up for combined cervical and scapulothoracic stretching and strengthening exercises for chronic neck pain
 - There was moderate evidence (1 trial, 263 patients) that there was no support for upper extremity stretching and endurance training exercises for chronic neck pain and function at immediate post-training, short term followup, and long term followup
 - There was moderate evidence (1 trial, 198 patients) showing support for a 2-minute and 12-minute scapulothoracic training program in reducing pain immediately post treatment in patients with acute/subacute/chronic neck pain
 - There was moderate evidence (1 trial, 100 patients) supporting a large reduction in pain and a large beneficial global perceived effect for patients with cervicogenic headache when these patients had endurance exercises including pressure biofeedback for the cervicospular region
- Numerous other comparisons were made with low, very low, or no evidence to support their effectiveness; for some comparisons, the authors reported "evidence" without specifying the quality or level of evidence

Authors' conclusions:

- Neck stretching and strengthening exercises are supported with moderate evidence for chronic neck pain relief, improving function and satisfaction with care in the long term
- Craniocervical endurance and low load endurance exercises are supported for treatment of cervicogenic headache in the long term
- There was low level evidence supporting neck strengthening exercise for acute onset cervical radiculopathy for pain but not for improving function
- There was moderate evidence that upper extremity strengthening and stretching or a general exercise program was of no benefit for chronic neck pain

Comments:

- The review presents too many comparisons to be summarized easily, but the evaluation of evidence appears to conform to the standards of other Cochrane reviews
 - o It is therefore likely that the authors of the review were attempting to present only comparisons that could be clearly specified in the literature they were using (for example, the “2-minute and 12-minute scapulothoracic training program in reducing pain immediately post treatment” might be overly narrowly specified, and training of 4 and 6 minutes may also be effective)
- Some comparisons appear to combine interventions in a manner which would be difficult to reproduce in clinical practice if the evidence were accepted as valid; for example, the forest plot in Figure 5 on page 15 for chronic neck pain compares “Cervical/UE stretch/ROM exercises + Cervical/Scapulothoracic+/-UE Strengthening +Dynamic/Static cervical stabilization + ANOTHER INTERVENTION vs THAT SAME INTERVENTION in the outcome Function at intermediate term follow-up”
 - o It appears that the common denominator of these interventions is an exercise component which applies a resistance force directly to the cervicospinal region; the authors judged the interventions from the four studies to be clinically homogeneous
- Studies requiring manual treatment from a trained provider were excluded, but there were trials requiring special equipment such as pressure biofeedback, dumbbells, and pulley systems
- Figure 3 on page 11 is a funnel plot of trials to detect publication bias, but there are too few data points to justify the authors' assertion that the funnel plot has a “classic small negative trial missing” shape, and should be disregarded
- Because the review fails in many places to address an explicit clinical question, the quality of the review suffers from the confusing nature of many of its comparisons
- It is still possible to salvage some evidence that general fitness exercises and upper extremity strengthening exercises are not likely to relieve mechanical neck pain
- It is also possible to salvage some evidence that exercises which involve stretching and resistance exercises of the cervical and the scapulothoracic muscles are likely to be beneficial for mechanical neck pain

Assessment: Adequate for some evidence that an exercise program which includes resistance training of the cervical and scapulothoracic muscles, combined with stretching of the same

muscles, is likely to be beneficial for mechanical neck pain. Adequate for some evidence that general fitness exercises and upper extremity exercises are unlikely by themselves to be beneficial for mechanical neck pain. Adequate for some evidence that cervicolscapular endurance exercises are beneficial for chronic cervicogenic headache.