Bronfort G, Evans R, et al. A Randomized Clinical Trial of Exercise and Spinal Manipulation for Patients With Chronic Neck Pain. Spine 2001;26:788-799.

Design: Randomized clinical trial

Population/sample size/setting:

- 191 patients (113 women, 78 men, mean age 44) treated for chronic neck pain at a university setting in Minnesota
  - Eligibility criteria were age 20 to 65 with primary mechanical neck pain lasting 12 weeks or more
  - Exclusion criteria were specific neck pathologies (infection/inflammation), referred neck pain, osteopenia, cervical spine injury, current or pending litigation, inability to work because of back pain, spinal manipulative treatment (SMT) or exercise therapy in past 3 months, or concurrent treatment for neck pain by other providers

Main outcome measures:

- Randomized to one of three groups: SMT plus exercise (n=64), MedX exercise (n=63), and SMT alone (n=64)
- All groups received 20 visits of 1 hour duration for 11 weeks
- SMT/exercise sessions consisted of 15 minutes of SMT by an experienced chiropractor, followed by 45 minutes of supervised low-technology exercise involving progressive strengthening exercises including a short aerobic warm-up and weight resistance
- MedX group received one-on-one supervision by a physical therapist, with 15 minutes of warm-up aerobic exercise followed by resistance exercises on a MedX cervical extension and rotation machines, which allow isolated testing of cervical extensors and rotators
- SMT group received 15 minutes of SMT by a chiropractor followed by 45 minutes of detuned (sham) microcurrent therapy
- Outcomes were measured at baseline, 5 weeks, 11 weeks, 3 months, 6 months, and 12 months
- Main outcomes were patient-reported (pain, neck disability index, and functional health status on the SF-36
- Additional measures were cervical muscle strength, endurance, and range of motion measured by a computerized load-cell transducer dynamometer
- Most of the patient-reported outcomes improved in all three groups during the 11 weeks of treatment; most improvements (pain, neck disability, SF-36) did not differ between the three groups
  - However, SMT/exercise patients reported higher satisfaction with care than with SMT alone
  - SMT/exercise had greater improvement in strength, range of motion, and endurance than SMT alone; MedX group had greater gains in extension strength
- Some group differences became measureable during the post-treatment follow-up year

    - Pain scores were lower in the two exercise groups than in the SMT only group for the year after the end of treatment
    - Satisfaction with care was greater in the SMT/exercise group than in the MedX and SMT only groups
- SMT/exercise outcomes did not differ from those for MedX except for patient satisfaction, which was greater in the SMT/exercise group

Authors' conclusions:

- Simple strengthening exercises in combination with SMT are more effective than SMT alone
- High-technology strengthening exercise is more effective than SMT alone
- SMT/exercise produced greater patient satisfaction than any other intervention
- The study was designed to provide a balance between the three groups so that all participants had the same number of one-hour sessions of their assigned interventions; this does not necessarily address the performance of the interventions when they are delivered in the real world of clinical practice

Comments:

- The need of the study design to balance the three groups in their frequency and time of treatment does, as the authors point out, create a departure from pragmatic design
- That is, no practitioner provides 15 minutes of SMT followed by 45 minutes of detuned microcurrent therapy
- However, it is more likely that the sham microcurrent would have a placebo effect than a nocebo effect; the sham intervention plus 15 minutes of SMT is not likely to be worse than 15 minutes of SMT only

Assessment: Adequate for evidence that exercise in addition to SMT is more effective in pain reduction than SMT alone for up to one year