

Supplemental Table 3: Summary of U.S. randomized controlled trials examining the use of complementary health approaches for neck pain^a

Complementary Approach	Study	Participants	Methods	Interventions	Primary Measures	Primary Outcomes	Conclusion
Massage therapy	Cook et al. ⁷⁹ , 2015	N=179 with chronic nonspecific neck pain. aged 20-64 years with mean age = 47.1 years; female= 65.5% ; mean neck pain intensity=5.8; 37% had neck pain longer than 5; Excluded pts with pathologically identifiable cause, was complex, or too mild. Excluded with potential contraindication, previous massage of CNP in last yr, or medicolegal issue or non-English speaking	RCT two phase dose finding vs usual care with 4 weeks plus 6 weeks phases	Massage for 4 weeks of one of five doses (30 min 2x or 3x/wk or 60 min 1x, 2x, or 3x/ week) of massage or WL control. Second randomization booster of non-control grp to weekly 60-min maintenance or none.	-Self-reported neck-related dysfunction (Neck Disability Index) and pain (0-10) at 12 weeks	No observed differences at 12 or 26 weeks for primary treatment group. Booster group improvement at 12 weeks in both dysfunction and pain, but nonsignificant at 12 weeks. Subgroup analysis by group and booster dose only effective in those randomized to one of 60 min. Booster doses should be incorporated into future trials of massage for chronic neck pain (booster not assessed against control) and benefit may be due to improvement over time.	Supports use

Massage therapy	Field et al. ⁸⁰ , 2014,	N=48 Neck pain, not defined, study population was medical school faculty and staff; The majority of the participants were female (77%), averaged 47 years of age, were middle income and were distributed 53% Hispanic, 20% Caucasian, 12% African-American,	RCT of massage versus waitlist control	Massage 1x weekly for 30 min plus daily 15 min self-massage for 4 weeks	VAS mood for immediate pain, stress, and ROM; and ROM by goniometer (flexion, extension and r/l flexion) and added for total scores at 4 weeks.	At the end of the intervention period, a significant increase in ROM and significant decrease pain was seen in the massage group compared to the wait list controls	Supports use
Massage therapy	Sherman et al. ⁸¹ , 2009	N=64 Neck pain Chronic, age 20-64 yrs with NP at least 3 months from Group Health HCS; mean age = 46.9 years; female=68.8%;white =84.3%; years with neck pain=7.6	RCT massage or self-care book on neck pain	Massage weekly x up to 10 weeks	Dysfunction (Neck Disability Index, 10 item 0-50 score) or 11 point bothersomeness score symptom improvement at 4, 10, 26 weeks	Reduction in symptom bothersomeness scale at 4 weeks significantly different, disappeared by 10 weeks. Mean NDI declined in massage group, only statistically significant at 4 weeks, also more clinically meaningful decline (5 pt change) in massage group at 4, 10, and 26 weeks.	Supports use
Massage therapy	Sherman et al. ⁸² , 2014	Adults aged 20 to 64 years with chronic nonspecific neck pain lasting at least 3 months N=228, pain score >=4; mean age = 46.7; female= 71.9%; white= 74.3%, mean pain neck pain	RCT of 4 weeks treatment	Massage for 4 weeks of one of five doses (30 min 2x or 3x/wk or 60 min 1x, 2x, or 3x/ week) of massage or Wait List control.	Neck disability Index (0-50) and pain intensity (0-10) at 5 weeks	Improvement seen with 60 min 2 and 3 / week for both NDI index and pain reduction vs. wait list control, No improvement was seen with 30 min treatments compared to controls.	

		intensity =5.8				A significant dose response relation was seen; for each additional weekly massage there was a significant improvement in NDI and neck pain	
Spinal manipulation	Evans et al. ⁸³ , 2012	Inclusion criteria were 18 to 65 years of age, primary complaint of mechanical, nonspecific neck pain (equivalent to grades I and II classification according to the Neck Pain Task Force), pain duration of 12 weeks or more, and neck pain score of 3 or greater (0–10 scale). Mean age= 46.3; females = 72.2%, mean duration of neck pain=9.4 years, mean severity of neck pain at baseline = 5.6	RCT. Three arms. N= 270	SM + supervised strengthening exercise; supervised Strengthening exercise alone; low level home exercise. Interventions lasted 12 weeks.	Patient rated pain (0-110 scale) at 12 weeks(end of intervention) and 52 weeks (40 weeks after intervention ended).	No difference was seen between SM + supervised exercise and supervised exercise alone. Both these groups showed significant improvement in neck pain versus home exercise at 12 and 52 weeks	Does not support use
Spinal manipulation	Hurwitz et al. ⁸⁴ , 2002	N=336 pt with neck pain and no treatment in past month	RCT 2x2x2 factorial design without control	Manipulation with or w/o heat, manipulation with or w/o EMS, mobilization w or w/o heat, mobilization w or w/o EMS	Pain and disability measured on an 11 point scale at 4 weeks	No difference in pain or disability was seen in manipulation group versus the mobilization group	Not relevant

Spinal manipulation	Maiers et al. ⁸⁵ , 2014	N=241 CNP, age 65 years plus Individuals had to have a primary complaint of weekly, mechanical NP, , with an average rating of ≥3 over the previous 2 weeks; p;l mean age = 72.3, female = 46.8%, median duration of neck pain= 6.3 years	RCT Spinal manipulation tx plus home exercise vs supervised rehabilitation exercise plus home exercise vs home exercise along	12 weeks treatment	Pain at 12 weeks based on 11-box numerical scale	Spinal manipulation with home exercise produced significantly better reduction in pain than home exercise alone.. No difference was seen betting manipulation/home exercise and supervised rehabilitation exercise plus home exercise	Supports use
Spinal manipulation	Gudavalli et al. ⁸⁶ , 2015	N=48 with chronic neck pain	RCT of 3 forces of 5 treatments over 2 weeks	Manual cervical distraction (MCD) Traction-based therapy for use as a manual touch control with 3 traction forces low (0-20), medium (21-50 N) , or high (51-100 N)	Pain VAS, NDI, credibility and expectancy questionnaire and adverse effects	Pilot for feasibility of traction-based, minimal intervention as a future control group. Benefit seen in NDI in medium and high force interventions, although not powered to test for benefit.	Not relevant

Footnotes

^a Abbreviations

NDI = Neck Disability Index

ROM = range of motion

RCT = randomized, controlled trial

SM = Spinal manipulation

VAS = Visual analog scale