**Selected by
Frauke Musial
Tromsø**

Latest Publications You Should Not Miss

Tilbrook HE, Cox H, Hewitt CE, Kang'ombe AR, Chuang LH, Jayakody S, Aplin JD, Semlyen A, Trehwela A, Watt I, Torgerson DJ: Yoga for chronic low back pain: a randomized trial. Ann Intern Med 2011;155:569–578.

Background: Previous studies indicate that yoga may be an effective treatment for chronic or recurrent low back pain.

Objective: To compare the effectiveness of yoga and usual care for chronic or recurrent low back pain.

Design: Parallel-group, randomized, controlled trial using computer-generated randomization conducted from April 2007 to March 2010. Outcomes were assessed by postal questionnaire. (International Standard Randomised Controlled Trial Number Register: ISRCTN 81079604)

Setting: 13 non-National Health Service premises in the United Kingdom.

Patients: 313 adults with chronic or recurrent low back pain.

Intervention: Yoga (n = 156) or usual care (n = 157). All participants received a back pain education booklet. The intervention group was offered a 12-class, gradually progressing yoga program delivered by 12 teachers over 3 months.

Measurements: Scores on the Roland-Morris Disability Questionnaire (RMDQ) at 3 (primary outcome), 6, and 12 (secondary outcomes) months; pain, pain self-efficacy, and general health measures at 3, 6, and 12 months (secondary outcomes).

Results: 93 (60%) patients offered yoga attended at least 3 of the first 6 sessions and at least 3 other sessions. The yoga group had better back function at 3, 6, and 12 months than the usual care group. The adjusted mean RMDQ score was 2.17 points (95% CI, 1.03 to 3.31 points) lower in the yoga group at 3 months, 1.48 points (CI, 0.33 to 2.62 points) lower at 6 months, and 1.57 points (CI, 0.42 to 2.71 points) lower at 12 months. The yoga and usual care groups had similar back pain and general health scores at 3, 6, and 12 months, and the yoga group had higher pain self-efficacy scores at 3 and 6 months but not at 12 months. Two of the 157 usual care participants and 12 of the 156 yoga participants reported adverse events, mostly increased pain.

Limitation: There were missing data for the primary outcome (yoga group, n = 21; usual care group, n = 18) and differential missing data (more in the yoga group) for secondary outcomes.

Conclusion: Offering a 12-week yoga program to adults with chronic or recurrent low back pain led to greater improvements in back function than did usual care.

Primary Funding Source: Arthritis Research UK.

Cherkin DC, Sherman KJ, Kahn J, Wellman R, Cook AJ, Johnson E, Erro J, Delaney K, Deyo RA: A comparison of the effects of 2 types of massage and usual care on chronic low back pain: a randomized, controlled trial. Ann Intern Med 2011;155:1–9.

Background: Few studies have evaluated the effectiveness of massage for chronic low back pain.

Objective: To compare the effectiveness of 2 types of massage and usual care for chronic back pain.

Design: Parallel-group randomized, controlled trial. Randomization was computer-generated, with centralized allocation concealment. Participants were blinded to massage type but not to assignment to massage versus usual care. Massage therapists were unblinded. The study personnel who assessed outcomes were blinded to treatment assignment. (ClinicalTrials.gov registration number: NCT00371384)

Setting: An integrated health care delivery system in the Seattle area.

Patients: 401 persons 20 to 65 years of age with nonspecific chronic low back pain.

Intervention: Structural massage (n = 132), relaxation massage (n = 136), or usual care (n = 133).

Measurements: Roland Disability Questionnaire (RDQ) and symptom bothersomeness scores at 10 weeks (primary outcome) and at 26 and 52 weeks (secondary outcomes). Mean group differences of at least 2 points on the RDQ and at least 1.5 points on the symptom bothersomeness scale were considered clinically meaningful.

Results: The massage groups had similar functional outcomes at 10 weeks. The adjusted mean RDQ score was 2.9 points (95% CI, 1.8 to 4.0 points) lower in the relaxation group and 2.5 points (CI, 1.4 to 3.5 points) lower in the structural massage group than in the usual care group, and adjusted mean symptom bothersomeness scores were 1.7 points (CI, 1.2 to 2.2 points) lower with relaxation massage and 1.4 points (CI, 0.8 to 1.9 points) lower with structural massage. The beneficial effects of relaxation massage on function (but not on symptom reduction) persisted at 52 weeks but were small.

Limitation: Participants were not blinded to treatment.

Conclusion: Massage therapy may be effective for treatment of chronic back pain, with benefits lasting at least 6 months. No clinically meaningful difference between relaxation and structural massage was observed in terms of relieving disability or symptoms.

Primary Funding Source: National Center for Complementary and Alternative Medicine.

Langevin HM, Fox JR, Koptiuch C, Badger GJ, Greenan-Naumann AC, Bouffard NA, Konofagou EE, Lee WN, Triano JJ, Henry SM: Reduced thoracolumbar fascia shear strain in human chronic low back pain. BMC Musculoskelet Disord 2011;12:203.

Background: The role played by the thoracolumbar fascia in chronic low back pain (LBP) is poorly understood. The thoracolumbar fascia is composed of dense connective tissue layers separated by layers of loose connective tissue that normally allow the dense layers to glide past one another during trunk motion. The goal of this study was to quantify shear plane motion within the thoracolumbar fascia using ultrasound elasticity imaging in human subjects with and without chronic low back pain (LBP).

Methods: We tested 121 human subjects, 50 without LBP and 71 with LBP of greater than 12 months duration. In each subject, an ultrasound cine-recording was acquired on the right and left sides of the back during passive trunk flexion using a motorized articulated table with the hinge point of the table at L4–5 and the ultrasound probe located longitudinally 2 cm lateral to the midline at the level of the L2–3 interspace. Tissue displacement within the thoracolumbar fascia was calculated using cross correlation techniques and shear strain was derived from this displacement data. Additional measures included standard range of motion and physical performance evaluations as well as ultrasound measurement of perimuscular connective tissue thickness and echogenicity.

Results: Thoracolumbar fascia shear strain was reduced in the LBP group compared with the No-LBP group ($56.4\% \pm 3.1\%$ vs. $70.2\% \pm 3.6\%$ respectively, $p < .01$). There was no evidence that this difference was sex-specific (group by sex interaction $p = .09$), although overall, males had significantly lower shear strain than females ($p = .02$). Significant correlations were found in male subjects between thoracolumbar fascia shear strain and the following variables: perimuscular connective tissue thickness ($r = -0.45$, $p < .001$), echogenicity ($r = -0.28$, $p < .05$), trunk flexion range of motion ($r = 0.36$, $p < .01$), trunk extension range of motion ($r = 0.41$, $p < .01$), repeated forward bend task duration ($r = -0.54$, $p < .0001$) and repeated sit-to-stand task duration ($r = -0.45$, $p < .001$).

Conclusion: Thoracolumbar fascia shear strain was ~20% lower in human subjects with chronic low back pain. This reduction of shear plane motion may be due to abnormal trunk movement patterns and/or intrinsic connective tissue pathology. There appears to be some sex-related differences in thoracolumbar fascia shear strain that may also play a role in altered connective tissue function.

Witzel T, Napadow V, Kettner NW, Vangel MG, Hämäläinen MS, Dhond RP: Differences in cortical response to acupuncture and electroacupuncture stimuli. BMC Neurosci 2011;12:73.

Background: FMRI studies focus on sub-cortical effects of acupuncture stimuli. The purpose of this study was to assess changes in primary somatosensory (S1) activity over the course of different types of acupuncture stimulation. We used, whole head magnetoencephalography (MEG) to map S1 brain response during 15 minutes of electroacupuncture (EA) and acupuncture (AP). We further assessed how brain response changed during the course of stimulation.

Results: Evoked brain response to EA differed from AP in its temporal dynamics by showing clear contralateral M20/M30 peaks while the latter demonstrated temporal dispersion. Both EA and AP demonstrated significantly decreased response amplitudes following five minutes of stimulation. However, the latency of these decreases were earlier in EA (~30 ms post-stimulus) than AP (> 100 ms). Time-frequency responses demonstrated early onset, event related synchronization (ERS), within the gamma band at ~70–130 ms and the theta band at ~50–200 ms post-stimulus. A prolonged event related desynchronization (ERD) of alpha and beta power occurred at ~100–300 ms post-stimulus. There was decreased beta ERD at ~100–300 ms over the course of EA, but not AP.

Conclusion: Both EA and AP demonstrated conditioning of S1 response. In conjunction with their subcortical effects on endogenous pain regulation, these therapies show potential for affecting S1 processing and possibly altering maladaptive neuroplasticity. Thus, further investigation in neuropathic populations is needed.

Beissner F, Deichmann R, Henke C, Bär KJ: Acupuncture – deep pain with an autonomic dimension? Neuroimage 2011; DOI: 10.1016/j.neuroimage.2011.12.045

Stimulation of acupuncture point Pc6, located above the median nerve, has been shown to be effective in treating nausea and vomiting. It has also frequently caused a heart rate reduction. The mechanism behind this autonomic reaction has not been clarified, so far. We combined brainstem-sensitive functional magnetic resonance imaging with heart rate recording and time-resolved rating of the needling sensation to measure neuronal correlates of sensations and autonomic reactions during acupuncture. On the cortical level, needling sensation activated typical pain-related areas, of which the ventromedial and dorsolateral prefrontal cortex and perigenual anterior cingulate cortex were further involved in mediating the heart rate response. In the brainstem, needling sensation activated nuclei of the descending pain control system, in which a network of hypothalamus, periaqueductal gray, rostral ventromedial medulla, and ventrolateral medulla was identified as the source of the heart rate changes. Our findings indicate that acupuncture may be a special pain stimulus, whose autonomic concomitants could explain its non-analgesic effects and in some cases even have a therapeutic potential.