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## Prevalence of Low Back and Pelvic Pain During Pregnancy

*Stefan Malmqvist, DC, MSc, et al.*

**Objective:** The purpose of this study was to investigate the cumulative prevalence of low back pain (LBP), pelvic pain (PP), and lumbopelvic pain **during pregnancy**, including features possibly associated with development of pregnancy-related PP, in an unselected population of women.

**Methods:** A retrospective cohort study was conducted in which all women giving birth at Stavanger University Hospital [Norway] in a four-month period were asked to participate and to fill in a questionnaire on demographic features, pain, disability, and Oswestry Disability Index. Inclusion criteria were singleton pregnancy of at least 36 weeks and competence in the Norwegian language.

**Results:** Nearly 50% of the women experienced moderate and severe PP during pregnancy. Approximately 50% of them had PP syndrome, whereas the other half experienced lumbopelvic pain. Ten percent of the women experienced moderate and severe LBP alone. These pain syndromes increased sick leave and impaired general level of function during pregnancy. Approximately 50% of women with PP had pain in the area of the symphysis. The analysis of risk factors did not present a unidirectional and clear picture.

**Conclusions:** Pelvic pain in pregnant women is a health care challenge in which moderate and severe pain develops rather early and has important implications for society. The observed associations between possible causative factors and moderate and severe LBP and PP in this study may, together with results from other studies, bring some valuable insights into their multifactorial influences and provide background information for future studies.

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## Muscular Stretching and Segmental Stabilization for Chronic Low Back Pain

*Fábio Renovato França, MSc, PT, et al.*

**Objective:** The purpose of this study was to compare the effects of two exercise programs, segmental stabilization exercises (SSEs) and stretching of trunk and hamstrings muscles, on functional disability, pain, and activation of the transversus abdominis muscle (TrA), in individuals

with chronic low back pain.

**Methods:** A total of 30 participants were enrolled in this study and randomly assigned to one of two groups as a function of intervention. In the segmental stabilization group (SS), exercises focused on the TrA and lumbar multifidus muscles, whereas in the stretching group (ST), exercises focused on stretching the erector spinae, hamstrings, and triceps surae. Severity of pain (visual analog scale and McGill pain questionnaire) and functional disability ([Oswestry disability questionnaire](#)) and TrA muscle activation capacity (Pressure Biofeedback Unit, or PBU) were compared as a function of intervention. Interventions lasted 6 weeks, and sessions happened twice a week (30 minutes each). Analysis of variance was used for intergroup and intragroup comparisons.

**Results:** As compared with baseline, both treatments were effective in relieving pain and improving disability ( $P < .001$ ). Those in the SS group had significantly higher gains for all variables. The stretching group did not effectively activate the TrA ( $P = .94$ ).

**Conclusion:** Both techniques improved pain and reduced disability. In this study, SS was superior to muscular stretching for the measured variables associated with chronic low back pain.

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### Lumbar Extension Traction vs. Stretching and Infrared Radiation for Mechanical LBP

*Aliaa A. Diab, PhD, et al.*

**Objective:** The purpose of this study was to investigate the effects of lumbar extension traction with stretching and [infrared](#) radiation compared with stretching and infrared radiation alone on the lumbar curve, pain, and intervertebral movements of patients with chronic mechanical low back pain (CMLBP).

**Methods:** This randomized clinical study with three-month follow-up was completed at the Cairo University research laboratory. Eighty patients (age ranged from 40 to 50 years) with CMLBP and a hypolordotic lumbar spine were randomly assigned to traction or a comparison group. The comparison group ( $n = 40$ ) received stretching exercises and infrared radiation, whereas the traction group ( $n = 40$ ) received lumbar extension traction in addition to stretching exercises and infrared radiation. The absolute rotatory angle, intervertebral movements, and visual analog scale were measured for all patients at three intervals.

**Results:** The results revealed a statistically significant difference between the groups at two follow-up time points compared with the baseline values for the translational and sagittal rotational movements of L3-L4, L4-L5, L5-S1, and L2-L3 (posttreatment) and absolute rotatory angle ( $P < .01$ ). There were no statistically significant changes in pain ( $P = .1$  and  $.3$ ) and L1-L2 ( $P = .072$  and  $.076$ ) or L2-L3 (at follow-up;  $P = .3$ ), and there was no significant difference between all the previous variables adjusted to the groups' baseline outcome interaction ( $P < .01$ ).

**Conclusion:** Lumbar extension traction with stretching exercises and infrared radiation was superior to stretching exercises and infrared radiation alone for improving the sagittal lumbar curve, pain, and intervertebral movement in CMLBP.

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### Chiropractic vs. Self-Management of Musculoskeletal Chest Pain: One-Year Follow-Up

*Mette J. Stochkendahl, DC, PhD, et al.*

**Objective:** We have previously reported short-term follow-up from a pragmatic randomized clinical

trial comparing two treatments for acute musculoskeletal chest pain: (1) chiropractic treatment and (2) self-management. Results indicated a positive effect in favor of the chiropractic treatment after four and 12 weeks. The current article investigates the hypothesis that the advantage observed at four and 12 weeks would be sustained after one year. In addition, we describe self-reported consequences of acute musculoskeletal chest pain at one-year follow-up.

**Methods:** In a nonblinded, randomized controlled trial undertaken at an emergency cardiology department and four outpatient chiropractic clinics, 115 consecutive patients with acute chest pain of musculoskeletal origin were included. After the baseline evaluation, patients were randomized to four weeks of either chiropractic treatment or self-management, with posttreatment questionnaire follow-up 52 weeks later. The primary outcome measures were change in pain intensity (11-point box numerical rating scale) and self-perceived change in pain (7-point ordinal scale).

**Results:** Both groups experienced decreases in pain, positive global, self-perceived treatment effect, and increases in the 36-Item Short Form Health Survey scores. No statistically significant differences were observed between groups at the one-year follow-up, and we could not deduce a common trend in favor of either intervention.

**Conclusions:** At the one-year follow-up, we found no difference between groups in terms of pain intensity and self-perceived change in chest pain in the first randomized clinical trial assessing chiropractic treatment vs. minimal intervention for patients with acute musculoskeletal chest pain. Further research into health care utilization and use of prescriptive medication is warranted.

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## Effects of a Centrally Applied Lumbar Sustained Natural Apophyseal Glide Mobilization

*Maria Moutzouri, MSc, et al.*

**Objective:** The purpose of this study was to investigate the effects of a manual mobilization technique on indirect measures of sympathetic nervous system activity.

**Methods:** Forty-five healthy volunteers participated in this randomized, single-blinded, parallel-group three-arm design (experimental, sham [placebo], and control group), comprising 15 subjects each. For the experimental group, lumbar mobilization involving an active movement, the Mulligan sustained natural apophyseal glide (SNAG), was applied on L4 spinous process by an experienced manual therapist. Sustained natural apophyseal glides were performed in sitting with active flexion (six times × three sets). The sham technique simulated the SNAG without applying any force. In the control group, participants were placed in a static sitting position throughout the experiment. Measures of skin conductance in the lower limbs (L4 dermatome) were recorded to reflect sympathetic nervous system activity in the preintervention, periintervention, and postintervention periods. Differences in percentage change of skin conductance were analyzed with analysis of variance and post hoc tests.

**Results:** Lumbar SNAG produced sympathoexcitation compared with the control group in the intervention period ( $P = .04$ ). No significant difference was found between SNAG and sham groups, and no statistically significant difference was found between groups in the final rest period.

**Conclusion:** The results of this study showed that, in asymptomatic participants, both lumbar SNAG and sham techniques performed on L4/5 intervertebral joint with active flexion induced a sympathoexcitatory response in lower limbs compared with the control group.

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## Ischemic Compression: Immediate Effect on Neck Function in CCS Patients

*Yin-Chou Lin, MD, PhD, et al.*

**Objective:** Cervicogenic cephalic syndrome (CCS), a group of diseases, consists of [cervicogenic headache](#) and dizziness. These symptoms may cause loss of physical function compared with other headache and dizziness disorders. The purpose of this case-control study was to assess the clinical effects of ischemic compression (IC) in patients with CCS.

**Methods:** Twenty-seven subjects with chronic neck pain (persisting for >3 months) and 26 healthy volunteers were examined. Subjects with organic lesion of the ear, nose, throat, eye, or central nervous system were excluded. The CCS group received IC over the maximal tender points of the origin of the posterior nuchal muscle. Sensory organization test (SOT) scores, cervical range of motion (ROM), and isometric strength of neck were measured before IC and after IC.

**Results:** The ROM of the cervical spine increased in all directions after IC ( $P < .0083$ ) in the CCS group, and isometric strength in the CCS group rose in all directions after IC ( $P = .000$ ). There was a significant difference in ankle strategy score under the sway-referenced vision and fixed support condition ( $P = .003$ ) between the control group and CCS before IC. The ankle strategy score of the CCS group improved substantially after IC under eyes-closed and sway-referenced support conditions ( $P = .003$ ). The visual and vestibular ratios in the CCS group also increased after IC ( $P = .006$  and  $P = .002$ , respectively).

**Conclusions:** The findings of this study showed that ROM of the cervical spine and isometric strength increased in all directions, and the SOT scores showed increased postural stability under conditions with swayed reference support after IC in the CCS group. The ratios for vestibular and visual function also increased after IC in the CCS group.

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## Electromyographic Activity of Masticatory Muscles: Influence of Different Upper Cervical Positions

*Nikolaus Ballenberger, PT, MPTSc, MSc, et al.*

**Objective:** The aim of this study was to determine the activity of the masseter and anterior temporalis muscles in relation to different positions of the upper cervical spine during maximal voluntary isometric clenching by surface electromyography (EMG).

**Methods:** This was a cross-sectional study with a repeated-measures design performed using 25 asymptomatic subjects (13 female and 12 male; mean age, 31 years; SD, 8.51). The EMG activity of the masseter and anterior temporalis muscles was recorded bilaterally during maximal clenching at neutral position and during extension, flexion, ipsilateral lateral flexion, contralateral lateral flexion, and ipsilateral and contralateral rotations in maximal flexion. In addition, the upper cervical range of motion and mandibular excursions were assessed. The EMG activity data were analyzed using a three-way analysis of variance in which the factors considered were upper cervical position, sex (male and female), and side (right and left), and the hypothesis of importance was the interaction side x position.

**Results:** The three-way analysis of variance detected statistically significant differences between the several upper cervical positions ( $F = 13.724$ ;  $P < .001$ ) but found no significant differences for sex ( $F = 0.202$ ;  $P = .658$ ) or side ( $F = 0.86$ ;  $P = .53$ ) regarding EMG activity of the masseter muscle. Significant differences were likewise observed for interaction side x position for the masseter muscle ( $F = 12.726$ ;  $P < .001$ ). The analysis of the EMG activity of anterior temporalis muscle did not produce statistically significant differences ( $P < .05$ ).

Conclusion: This preliminary study suggests that the upper cervical movements influence the surface EMG activity of the masseter muscle. These findings support a model in which there are interaction between the craniocervical and the [craniomandibular](#) system.

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