Background: Full recoil golf swings have been implicated in back pain and injury in golfers. Evidence suggests that a restricted backswing may reduce the potential for injury without compromising performance.

Objective: To both examine golf swing performance and selected muscular actions of the trunk and shoulder during a full recoil swing as compared to a modified short backswing.

Methods: Electromyographic (EMG) recordings were taken bilaterally from the lumbar, external oblique, latissimus dorsi, and right pectoral muscles in seven golfers during a full recoil swing and a modified short backswing. High-speed videotape was used to measure backswing angle reduction. Club-head velocity (CHV) and ball contact accuracy were quantified using a swing speed indicator and clubface contact tape, respectively.

Results: Shortening of the backswing by 46.5 ± 24.7 percent had no effect on stroke accuracy as measured by mean deviation from the target spot on the club (19.0 ± 7.8 vs 19.3 ± 9.2 mm). CHV was not significantly reduced (33.9 ± 2.5 vs 31.2 ± 2.2 m/s). However, EMGrms was decreased 19 percent in the right oblique muscle from 750ms to 250ms pre-impact (p<0.05). During the acceleration phase, activation of left lumbar muscle decreased by 12 percent, whereas activation of right latissimus muscle increased by 21 percent. Although left lumbar muscle activity during follow-through increased 14 percent, there was a substantial (17 percent) but nonsignificant decrease of activation to trunk muscles (p=0.11). There was a general trend toward an increased activation of the shoulder musculature from 250ms pre-impact to 500ms post-impact.

Conclusions: These data support the notion that short backswings in golf may reduce trunk muscle activation and possibly reduce back injury and pain without negatively impacting on swing accuracy or
CHV. The short swing, however, increases shoulder muscle activation and may, in turn, promote risk for shoulder injury.

**Key Indexing Terms:** Golf; injury; back pain.

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**General practice and chiropractic in Norway: How well do they communicate and what do GPs want to know?**

Jennifer Langworthy, MPhil, and Jeppe Birkelid, BSc(hons) human sciences (chiropractic)

**Background:** Some within the medical establishment believe that the education and training of chiropractors is grounded in orthodox medicine and that these professional groups share a common language allowing for close dialogue. However, levels of communication and collaboration often remain low. Furthermore, studies have shown chiropractors to be lax in providing written reports to referring clinicians, a practice important to both patient care and interprofessional relationships.

**Objective:** To investigate existing levels of communication between general practitioners (GPs) and chiropractors in Norway and to identify trends in GP preferences for future interprofessional communications.

**Design and Setting:** A postal survey was conducted on a random sample of 230 GPs in Norway.

**Results:** A response rate of 51 percent was achieved. All respondents reported having made at least one referral to a chiropractor. Most (63 percent) referred infrequently and only seven percent communicated often with a chiropractor. Of those in contact with a chiropractor, 75 percent of communications were by telephone. One-fifth of respondents negatively assessed the quality of written reports. Approximately one-third of those GPs who had referred patients did not receive a report, despite this being obligatory in Norway. Twelve percent reported problems with terminology. A written report for future reporting was favored by 75 percent of the GPs; they wanted the report to contain information on examination findings, diagnosis, treatment and advice given.

**Conclusion:** In general, communications between GPs and chiropractors in Norway are not ideal, particularly with regard to frequency and written quality. However, this is not unique to Norway. With
increasing emphasis on multidisciplinary healthcare, greater understanding and better communication is needed to optimize the benefits of such an approach to patient management. Relevant, timely, consistent reporting on a reciprocal basis, together with a shared vocabulary, should help this process.

**Key Indexing Terms:** General practice; chiropractic; interprofessional communication; multidisciplinary health care.

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**Active range of motion in the cervical spine increases after spinal manipulation (a.m. toggle recoil).**

Wayne Whittingham, DC, PhD, and Niels Nilsson, DC, MD, PhD

**Background:** It has been generally assumed that spinal manipulation has the biomechanical effect of increasing spinal range of motion. Past research has shown that there are likely no lasting changes to passive range of motion, and it is unclear whether there is an increase in active range of motion after manipulation.

**Objectives:** To study changes in active cervical range of motion following spinal manipulation of the cervical spine.

**Design:** A double-blind, randomized controlled trial at the outpatient clinic of the Phillip Chiropractic Research Centre, RMIT University, Melbourne, Australia.

**Methods:** 105 patients with cervicogenic headache were randomized into two groups. After a baseline observation period, group two received manipulation (a.m. toggle recoil) to the cervical spine, while group one received sham manipulation. In the next trial phase, group one received manipulation, while group two received no treatment. This was followed by the final trial phase, in which group two received sham manipulation and group one received no treatment. After each trial phase, active range of cervical motion was measured with a strap-on head goniometer by two blinded examiners.

**Results:** After receiving spinal manipulation, active range of motion in the cervical spine increased significantly (p < .0006) in group two compared to group one. This difference between treatment groups disappeared again after the third trial phase where group one also received manipulation, as expected.

**Conclusions:** Spinal manipulation of the cervical spine increases active range of motion.
**Key Indexing Terms:** Spine; range of motion; chiropractic; osteopathy.

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**A descriptive study of medical and chiropractic patients with chronic low-back pain and sciatica: Management by physicians (practice activities) and patients (self-management).**

Joanne Nyiendo, PhD; Mitchell Haas, DC; Bruce Goldberg, MD; and Carol Lloyd

**Background:** A practice-based study of ambulatory low-back pain patients noted a long-term outcomes advantage for self-referred chiropractic patients over medical patients with chronic low-back pain and radiating pain below the knee. The frequency of self-care education by physicians in both provider cohorts, coupled with current thinking on management of chronic low-back pain, led to an exploration and description of physicians’ noncore practice activities and patients’ self-management attitudes and behaviors.

**Methods:** A longitudinal, practice-based, observational study was undertaken in 14 general practice and 51 chiropractic community-based clinics. Two thousand nine hundred forty-five consecutive patients with ambulatory low-back pain of mechanical origin were enrolled; 268 patients comprised the subgroup of chronic low back patients with radiating pain below the knee. Patients’ low back status was followed for one year. Data on physicians’ practice activities were obtained from doctor questionnaires completed at each patient visit and from chart abstraction. Patient data obtained from self-administered questionnaires at enrollment included sociodemographics, complaint characteristics, health status, and health encounter preferences. Questionnaires mailed at two weeks; one month; three months; six months; and 12 months collected data on low-back complaint status and satisfaction with treatment. At 1-3 years follow-up, mailed questionnaires collected data on patient attitudes and behaviors toward self-management.

**Results:** Physicians’ core practice activities were as expected. Exercise plans and self-care education (>55 percent) were conspicuous in the frequency of their utilization in the DC cohort. Medical patients appeared to rely more on family and friends for support during periods of back trouble. DC patients were characterized by greater low back self-efficacy motivation (P=.000). Both groups showed evidence of self-care activities during and between bouts of back pain, although medical patients were far more likely to have chosen bed rest (P=.007).
Conclusions: The chiropractic encounter may have enhanced patients’ self-efficacy motivation, leading to better coping abilities and better pain and disability outcomes. Understanding, respecting, and capitalizing on the role and influence of psychosocial factors could help all physicians become more effective healers and counselors for their patients with back pain.

Key Indexing Terms: Low-back pain; medical physicians; chiropractic; practice activities; self-efficacy; self-management.

Patient satisfaction with chiropractic physicians in an independent physicians’ association
Hugh Gemmell,DC,EdD, and Brad Hayes,DC

Background: Satisfaction with care is one of the variables that can be used in determining the results of medical care. Patient satisfaction surveys allow managed care plans to determine how well its providers meet certain standards.

Objective: To determine the level of satisfaction with chiropractic care in a random sample of patients seen by physician members of a chiropractic independent physicians association.

Design: A visit specific questionnaire was mailed to a random sample of 150 patients from health insurance claims filed in the first two months of 2000.

Results: The rate of return was 44 percent. Length of time to get an appointment was rated excellent by 84.9 percent of respondents; convenience of the office was rated by 57.7 percent as excellent; getting through to the office by telephone was rated as excellent by 77.3 percent; length of wait at the office was rated as excellent by 75.7 percent; and the time spent with the provider was rated as excellent by 74.3 percent. Explanation of what was done during the visit was rated as excellent by 72.8 percent; the technical skills of the chiropractor were rated as excellent by 83.3 percent. The personal manner of the chiropractor was rated as excellent by 92.4 percent, and 95.5 percent, of responders stated they would definitely recommend the provider to others. The visit overall was rated as excellent by 83.3 percent of responders.

Conclusion: The study demonstrated a high satisfaction rate of chiropractors by managed care patients.
Key Indexing Terms: Patient satisfaction; chiropractic.

Background: MRI is often used to assess for disc displacement following manipulation, but limited information about the true incidence of iatrogenic herniations exists. Preliminary data must be obtained concerning the size of different types of displacement to further assess this relationship. The reliability of chiropractic radiologists in assessing discs, and a comparison of measuring devices should be evaluated.

Objective: To identify average measurements for normal and displaced discs; to assess the reliability of measurements by chiropractic radiologists.

Study Design: Intraobserver and interobserver reliability study assessing cervical disc displacement on MR scans.

Methods: Three evaluators assessed the discs on 106 MRI scans. Six categories were assessed and compared. Thirty-seven scans were reassessed for intraobserver comparisons. Interobserver and intraobserver variations and measurement device correlations were determined.

Results: Interexaminer measurement reliability for the two devices was 0.80 to 0.84. Intraexaminer reliability ranged from 0.58 to 0.94. Interexaminer and intraexaminer agreement for the presence of disc displacement was 86 percent (K=0.69) and 78 to 85 percent (K=0.50-0.67), respectively; for the presence of osteophytes, 92 percent (K=0.54) and 86 to 95 percent (K=0.60 to 0.80); and for the classification of disc displacements, 76 percent (K=0.53) and 73 to 80 percent (K=0.44-0.61). Distinguishing between normal versus bulged discs demonstrated the greatest classification disagreement. Clear size differences between the types of disc displacement were noted. The ruler and digitizer correlation coefficient was 0.96.

Conclusions: Inter- and intraexaminer agreement were good to very good concerning measurements, and fair to good concerning disc assessments. Different disc displacement types demonstrated obvious mean size differences. No significant mean difference in measurements between the ruler and the digitizer was noted.
Key Indexing Terms: Magnetic resonance imaging; intervertebral disc; measurement reliability; herniation; cervical spine.

Chiropractic treatment of postsurgical neck syndrome utilizing mechanical force, manually assisted short-lever spinal adjustments.
Bradley Polkinghorn, DC, and Christopher Colloca, DC

Objective: To describe a case of postsurgical neck pain, following multiple spinal surgeries, that was successfully treated via chiropractic intervention, utilizing instrumental adjustment of the cervical spine.

Clinical Features: A 35-year-old female suffered from chronic neck pain for over five years following two separate surgeries of the cervical spine: a diskectomy at C3/4 and a fusion at C5/6. Surgeries were performed six months apart in an attempt to resolve persistent neck pain and spasm of the cervical musculature. Neither surgery was effective in relieving the patient’s pain. Five years following the second surgery, a third surgery was recommended by the patient’s physicians to alleviate the chronic pain. In an effort to avoid further surgical intervention, the patient elected to seek chiropractic evaluation of her condition.

Intervention and Outcome: The patient was treated with conservative instrumental chiropractic manipulation consisting of mechanical force, manually assisted (MFMA) short lever spinal adjustments, rendered via an Activator Adjusting Instrument II (AAI). She comfortably tolerated the treatment and responded favorably to said therapy. All chronic symptomatology had resolved within 30 days of instituting chiropractic adjustments with an AAI. More interestingly, longitudinal examination over the course of the ensuing two years revealed that the patient experienced no residuals or further recurrences of her previous chronic problem, following her initial course of chiropractic care.

Conclusion: Chiropractic treatment of postsurgical neck syndrome may be effectively implemented, in certain cases, via MFMA adjusting procedures, utilizing an AAI. The use of instrumental adjustment methodology may provide chiropractic physicians with an effective alternative to manual manipulation in those cases in which the patient’s surgical history or presenting symptomatology make forceful manipulation of the spine, particularly performed at end-range, inappropriate. This approach may be contemplated by physicians faced with managing this type of condition. Further study should be made in
this regard, in an academic research setting, to determine the safest most effective approaches to managing postsurgical patients in a chiropractic setting.

**Key Indexing Terms:** Arthrodesis; cervical spine; chiropractic manipulation; failed back surgery syndrome; fusion; neck pain.

The centralization phenomenon in chiropractic spinal manipulation of discogenic low back pain and sciatica.

Anthony Lisi, DC

**Objective:** To describe three cases of discogenic low back pain and leg pain where the centralization phenomenon was used in chiropractic spinal manipulation decision-making and prognosis.

**Clinical Features:** Three males with low back pain and sciatica, positive straight leg raise, mild neurologic deficits, and MRI evidence of discogenic pathology presented for chiropractic treatment. Two of the subjects exhibited centralization of pain upon provocation testing; the third did not.

**Intervention and Outcome:** All subjects were treated with chiropractic side-posture manipulation, ancillary therapies, and pain medications. The two subjects whose pain centralized had excellent outcomes to treatment. The one whose pain did not centralize had a poor outcome and eventually required surgery.

**Conclusion:** Assessment of the centralization phenomenon provided valuable diagnostic and prognostic information regarding chiropractic side-posture manipulation in this series of case.

**Key Indexing Terms:** Centralization; chiropractic manipulation; intervertebral disc; sciatica.

Analysis of possible lower lumbar strains due to the structural properties of car seats: A review of some recent technical literature.

David Johnson, Prof. Dr. Ir., and Marcel Nève, Dr.Sc.

**Background:** Epidemiologic studies on low back pain (LBP) persistently point to a strong correlation with whole-body vibration due to vehicle driving. Vehicle vibration enters the driver’s body through the seat. The analysis of the vibrational properties of vehicle seats is thus a necessary prerequisite for understanding
the correlation between LBP and driving.

**Objective:** To examine structural properties of vehicle seats that might be a source of LBP for the passenger, to accordingly modify the seat design, and to have it tested by car drivers suffering from LBP.

**Data sources:** Recent studies of the vibrational properties of car seats published in automotive technical journals not readily accessible to a medical audience were summarized and further analyzed from a biomechanical point of view.

**Conclusion:** Due to the strong coupling between the seat backrest and the car floor, a differential motion between backrest and seat cushion appears when driving. It inevitably induces continuous strains in the lower lumbar spine of the seat occupant and is thus a possible source of LBP. Vibrational measurements performed on a prototype car seat with vertically moving backrest show that compared to a standard seat with fixed backrest, the differential motion is strongly reduced. The resulting relief of LBP is confirmed by drivers using this type of seat.

**Key Indexing Terms:** Low back pain; sitting; biomechanics; motor vehicles; vibration.

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