

Progressive scoliosis with vertebral rotation after lumbar intervertebral disc herniation in a 10-year-old girl

Grass JP, Dockendorff IB, Soto VA, Araya PH, Henriquez CM. *Spine* 1993; 18(3):336-338.

A case report of a 10-year-old girl with a herniated disc is presented. The most significant symptoms were progressive scoliosis with a flat back and paravertebral muscle spasm. An absent H reflex on the left and an increased latency of the somatosensory-evoked potentials of the left posterior tibial nerve were found. The computed tomographic scan of the lumbar spine showed a large central left-sided disc protrusion at the L5-S1 level. Our case presents the youngest patient with documented intervertebral disc herniation and the only one with severe scoliosis and vertebral rotation. The curve was not structural because it improved with surgery and an orthosis was not necessary.

Laboratory tests in rheumatoid arthritis

Baum J. *J Musculoskel Med* 1993; 10(5):55-65.

Although the history and physical examination are the primary tools for the diagnosis of rheumatoid arthritis (RA), laboratory tests contribute important information about diagnosis and also aid in prognosis and in monitoring the response to therapy. Because no one laboratory test is appropriate for all patients or all disease stages, the clinician must be familiar with a variety of tests and their appropriate use. Among the most helpful are the erythrocyte sedimentation rate and measurement of C-reactive protein, which are about equally accurate, available, and inexpensive. The anticipated value of testing for the rheumatoid factor was diminished when it was found to be present in healthy persons; nevertheless, a high titer of rheumatoid factor may be a significant diagnostic finding in RA.

The epidemiology of bilateral slipped capital femoral epiphysis

Loder RT, Aronson DD, Greenfield ML. *J Bone Jt Surg* 1993; 75A(8):1141-1147

The records of 224 children who had a slipped capital femoral epiphysis and who had no underlying metabolic or endocrine disorder were studied retrospectively to investigate the epidemiology of bilateral slipped capital femoral epiphysis. Eighty-two (37 per cent) of the 224 children (fifty-one boys and thirty-one girls) had a bilateral slip. Sixty-four of these children were black and eighteen were white.

The age at the time of the diagnosis of the first slip was 13 ± 1.7 years (mean and standard deviation), the duration of the symptoms was 5 ± 5.0 months, and the angle of the slip was 26 ± 16 degrees. Obese children were younger at the time of the diagnosis of the first slip (12 ± 1.6 compared with 13 ± 1.6 years for the children who were not obese, $p = 0.001$).

The diagnosis of a slipped capital femoral epiphysis was made simultaneously in both hips in forty-one children and sequentially in

forty-one children. Compared with children in whom both hips were diagnosed simultaneously, the children in whom the hips were diagnosed sequentially had had a shorter duration of the symptoms before the diagnosis of the first slip (3 ± 2.4 compared with 7 ± 5.9 months, $p = 0.0003$), were younger at the time of the diagnosis of the first slip (12 ± 1.9 compared with 13 ± 1.2 years, $p = 0.001$), and tended to be more obese ($p = 0.025$). In 88 per cent of the patients who had sequential slips, the second slip was diagnosed within eighteen months after the diagnosis of the first slip.

The children who had a unilateral slip and in whom a slip of the contralateral hip developed subsequently were younger at the time of the diagnosis of the first slip than those in whom a contralateral slip did not develop (12 ± 1.9 compared with 13 ± 1.6 years, $p = 0.002$).

We recommend frequent follow-up examinations for the first two years after the diagnosis of a unilateral slip, especially if the patient is a girl who is twelve years old or less or a boy who is fourteen years old or less. In order to prevent a delay in the diagnosis of a second slip, follow-up should continue until there is definite radiographic evidence of physical closure in both hips.

Long-term results of Boston brace treatment on vertebral rotation in idiopathic scoliosis

Willers U, Normelli H, Aaro S, Svensson O, Hedlund R. *Spine* 1993; 18(4):432-435.

The long-term effect of Boston brace treatment was investigated by computed tomography measurements before treatment, after bracing, and at mean follow-up at 8.5 years in 25 patients with idiopathic scoliosis. At follow-up, the pretreatment Cobb angle, the vertebral rotation, the rib hump, and the translation of the apical vertebra were not significantly changed. The sagittal diameter of the thoracic cage was significantly decreased at follow-up. The current study demonstrates that the Boston brace does not improve, but prevents progression of vertebral rotation, translation, rib hump, and Cobb angle in idiopathic scoliosis. The reduced sagittal diameter is noteworthy and may be of importance for cosmesis and pulmonary function.

Acute slipped capital femoral epiphysis: the importance of physeal stability

Loder RT, Richards BS, Shapiro PS, Reznick LR, Aronson DD. *J Bone Jt Surg* 1993; 75A(8):1134-1140.

To test the traditional classification system of slipped capital femoral epiphysis, we evaluated the presenting symptoms and radiographs of fifty-four patients and reclassified the slipped epiphysis as unstable or stable, rather than acute, chronic, or acute-on-chronic. Slips were considered to be unstable when the patient had such severe pain that weight-bearing was not possible even with crutches. Slips were considered to be stable when the patient could bear weight, with or without crutches.

We reviewed the records of fifty-five hips in which the slip would have been classified as acute because the duration of symptoms was less

than three weeks; thirty of these were unstable and twenty-five were stable. All slips were treated with internal fixation. A reduction occurred in twenty-six of the unstable hips and in two of the stable hips. Fourteen (47 per cent) of the thirty unstable hips and twenty-four (96 per cent) of the twenty-five stable hips had a satisfactory result. Avascular necrosis developed in fourteen (47 per cent) of the unstable hips and in none of the stable hips. We were not able to demonstrate an association between early reduction and the development of avascular necrosis.

Lead content in 170 brands of dietary calcium supplements

Bourgoin BP, Evans DR, Cornett JR, Lingard SM, Quattrone AJ. *Am J Public Health* 1993; 83:1155-1160.

Objectives. Elevated lead levels in calcium supplements may pose a health risk, particularly to children with milk intolerance who rely on these products to meet their calcium requirement. Earlier reports chiefly focused on lead content in supplements derived from bonemeal and dolomite. This study undertook to determine the lead levels in the major forms of calcium supplements currently available.

Methods. The lead content was measured in 70 brands of calcium supplements grouped in the following five categories: dolomite, bonemeal, refined and natural source calcium carbonate, and calcium chelates.

Results. The lead levels measured in the supplements ranged from 0.03 $\mu\text{g/g}$ to 8.83 $\mu\text{g/g}$. Daily lead ingestion rates revealed that about 25% of the products exceeded the US Food and Drug Administration's "provisional" total tolerable daily intake of lead for children aged 6 years and under. Less than 20% of the supplements had a "normalized" lead levels comparable to or lower than that reported for cow's milk.

Conclusions. Children are the most sensitive to the low-level effects of lead. If calcium supplements are to provide an alternate source of calcium to some of these individuals, they should also deliver concomitant lead dosages no greater than those obtained from milk products themselves.

A method for the measurement of three-dimensional scapular movement

Johnson GR, Stuart PR, Mitchell S. *Clin Biomech* 1993; 8:269-273.

Summary. Many disorders of the shoulder complex are accompanied by changes in the pattern of scapular motion which is difficult to measure except radiographically. In order to study the three-dimensional motion of the scapula which accompanies arm movements, a technique has been developed using a three-pointed locator which can be applied over the three bony landmarks - the acromial angle, the inferior angle, and the root of the scapular spine. The spatial orientation of the locator relative to the trunk was measured using an electromagnetic movement sensor (ISOTRAK) which has been shown to be clinically reliable. Measurements of scapular plane rotations during abduction showed particularly good agreement with published data; variations in measurements of the out-of-plane angles were attributed to difficulties

of contacting the acromion reliably when the deltoid muscle was contracted. It is concluded that the system is suitable for clinical use in the study of shoulder pathology.

Relevance. Both the understanding of pathological conditions and the monitoring of recovery require clinical movement measurement. This non-invasive technique allows such measurements to be made in the clinical setting.

Chiropractic care parameters for common industrial low back conditions

Mootz RD, Waldorf VT. *Chiro Tech* 1993; 5(3):119-125.

A detailed description of chiropractic care parameters used at a large occupational medicine center is presented. The algorithms were derived from clinical needs of the facility, expert opinion, and reviews of several contemporary written protocols. Twelve of the most common industrially related low back conditions are included. The algorithms are grouped according to nondiscogenic and discogenic conditions. The guidelines are consistent with many third party chiropractic review policies as well as the recently published Chiropractic Quality Assurance Guidelines and Practice Parameters. The first algorithm is based on uncomplicated joint dysfunction and is considered the base algorithm. Other more complicated conditions follow, and a preface is included for each describing specific issues relevant to each condition. The purpose of these algorithms was to help standardize care in the clinic to foster interdisciplinary communication and provide consistency in administration for research purposes.

Mandating vitamin K prophylaxis for newborns in New York State

Tulchinsky TH, Patton MM, Randolph LA, Meyer MR, Linden JV. *Am J Public Health* 1993; 83:1166-1168.

New York State's infant deaths and hospitalizations attributed to hemorrhage disease of the newborn and other neonatal hemorrhage conditions were reviewed. In 65% of 34 deaths reviewed, vitamin K was not documented as given or was given only after the onset of hemorrhage. Vitamin K was not included in standing orders in any of the 22 hospitals contacted. As a result of this review, vitamin K prophylaxis was made a mandatory newborn care procedure in the State Public Health Code.

Screening for proteinuria in patients with hypertension or diabetes mellitus

Guthrie RM, Lott JA. *J Fam Pract* 1993; 37:253-256.

Background. Proteinuria is an early indication of renal disease. This study was conducted to evaluate the usefulness of dipstick urinalysis in patients with chronic diseases including hypertension and diabetes mellitus.

Methods. At a university family practice center, patients without urinary tract disorders underwent dipstick urinalysis.

Results. Of the 796 patients evaluated, increased proteinuria, possibly indicating early renal disease, was detected in 4% of healthy patients, 16% of patients with hypertension, 29% of patients with diabetes, and 53% of patients with both hypertension and diabetes. A higher incidence of proteinuria was found among African American patients with hypertension or diabetes or both than among white patients.

Conclusions. Regular dipstick evaluation for proteinuria may be indicated in patients with hypertension or diabetes mellitus or both, particularly African American patients with disorders.

Isometric strength in flexors, abductors and external rotators of the shoulder

Lannersten L, Harms-Ringdahl K, Schüldt K, Ekholm J, Stockholm Music 1 Study Group. *Clin Biomech* 1993; 8:235-242.

Summary. The aim of this study was to map the isometric shoulder muscle strength of 96 men and 90 women randomized from the population register of Stockholm citizens (reference groups), and of 83 male furniture removers and 89 female secretaries (aged 19-65 years, all four groups). Maximum isometric strength of the right-side shoulder flexors (90° joint angle), abductors, and external rotators (0°) was recorded with the subject in a standardized position in an adjustable chair. Women had 43, 55, and 56% of the men's strength in the abductors, flexors, and external rotators respectively. Neither of the female test groups showed any change in maximum isometric strength with increasing age. Men from the reference group showed an age-related difference only in shoulder flexor strength, where the older men (45-65 years) had 89% of the younger men's (19-44 years) strength. The strength values of older furniture removers were 77-83% of the younger colleagues' values in all muscle groups tested. The muscular strength utilization ratio (MUR%) when holding the arm without external load at 90° shoulder flexion was 22-25 MUR% for the male groups and 34 MUR% for the female groups, which shows that the muscular load on the shoulder caused by the weight of the arm is of great importance.

Relevance. To plan and evaluate effects of exercise programmes, normative strength standards for different age groups are of importance. As such a large part of arm maximum flexor strength was used to hold the arm in 90° flexion, work place design and ergonomic training should allow for work to be performed close to the body.

Autonomic nervous system involvement in rheumatoid arthritis: 50 cases

Toussiro E, Serratrice G, Valentin P. *J Rheumatol* 1993; 20:1508-1514.

Objective. To investigate the involvement of the autonomic nervous system (ANS) in rheumatoid arthritis (RA), which is rarely discussed.

Methods. Fifty cases of RA were selected, excluding all patients liable to develop dysautonomia or having a treatment interfering with ANS. They were investigated by cardiovascular tests of heart rate

variations in deep breathing, Valsalva maneuver and orthostatic change in posture. These quantified tests were reported as ratios: breathing, Valsalva and 30/15. A control series of 82 healthy subjects was tested to determine the abnormal threshold for each one of the 3 tests and allowed a correlative study. Dysautonomia was defined when 2 of the 3 tests were pathological. According to these criteria, 30 patients with RA with ANS dysfunction were retained.

Results. The clinical examination of these patients showed no neurological sign or autonomic sign but there was an inflammatory syndrome. Rheumatoid factors (RF) were frequently present as were slowly progressive articular destructions. The statistical study revealed a significant difference between the series of RA patients and the control series, only for the Valsalva maneuver ($p < 0.01$) and there was no obvious correlation between ANS dysfunction in RA and markers of inflammation, presence of RF, duration of disease or degree of articular destructive lesions.

Conclusion. Our study is in agreement with the literature which reports an ANS involvement in RA with a same frequency but remaining primarily subclinical and probably isolated from other peripheral or central nervous system damage. The physiopathology of this form of dysautonomia is discussed and an immunological mechanism is suggested.

Vitamin and mineral supplement use and mortality

Kim I, Williamson DF, Byers T, Koplan JP. *Am J Public Health* 1993 Apr; 83:546-550.

Objective. To examine the association between reported vitamin and mineral supplement use and mortality.

Design. Cohort study of adults in the First National Health and Nutrition Examination Survey (NHANES I) with mean follow-up of 13 years.

Setting. United States.

Participants. 11,348 of 14,407 adults who were noninstitutionalized and aged 25 to 74 years when recruited from 1971 to 1975 provided initial dietary data. Participants with missing data on education or drug abuse ($n = 108$) or on vital status in 1987 ($n = 474$) or date of death ($n = 8$) were excluded. 10,758 persons participated (mean age, 50 years; 6,483 women).

Assessment of risk factors. Vitamin and mineral supplement use was reported on the baseline and first follow-up questionnaires. Supplement use was defined as regular (daily use), irregular (< daily to once/week), and none (< weekly). Potential confounders were age, race, marital status, education, special diet (ordered by a physician because of a specific disease), body mass index, weight status (underweight, normal, overweight), alcohol use, smoking, and medical conditions at baseline. A 24-hour dietary recall measured total calories, protein, carbohydrates, fat, vitamins A and C, thiamin, riboflavin, niacin, calcium, phosphorus, and iron. Estimated nutrient needs had 3 categories: none, 1 or 2, and ≥ 3 nutrients $< 80\%$ of the 1989 recommended allowances. Participants were interviewed once from 1971 to 1975 and again during 1981 to 1984.

Main outcome measure. Mortality data from the National Center for

Health Statistics.

Main results. 22.5% of the participants reported regular use of supplements; 10%, irregular use; and 67.5%, no use. 833 participants died (181 from cancer). Using Cox proportional hazards analyses adjusted for all confounders, regular supplement was not associated with an altered risk for all-cause mortality (relative risk [RR] for men who used supplements regularly, 0.94 [95% CI, 0.82 to 1.06] and RR for women, 1.02 [CI, 0.90 to 1.71]). The risk for mortality from cancer did not differ for regular users of supplements compared with nonusers (RR for men, 0.90 [CI, 0.68 to 1.19]) and RR for women, 0.85 [CI, 0.64 to 1.14]). For women who were underweight, the risk for mortality was increased with regular supplement use (RR, 1.97 [CI, 1.23 to 3.16]). Supplement use was not associated with mortality in any of the subgroups defined by dietary intake at baseline.

Conclusion. Vitamin and mineral supplement use by adults in the United States was not associated with a change in mortality.

Posture affects motion coupling patterns of the upper cervical spine

Panjabi MM, Oda T, Crisco III JJ, Dvorak J, Grob D.
J Orth Res 1993; 11:525-536.

Measurements of motions of the cervical spine are used to help diagnose the problems of clinical instability due to degenerative changes and trauma. For a better interpretation of the three-dimensional motions of the upper cervical spine, knowledge of the effects of posture on these motions is necessary. Seven fresh human cadaveric C0-C3 spinal specimens were utilized. Each specimen was put in three distinct sagittal plane postures: full flexion, neutral, and full extension. At each posture, two load types were applied: left and right axial torques, and left and right lateral bending moments up to 1.5 Nm. The resulting three-dimensional relative motions of C0-C1 and C1-C2 were measured, with use of nonconstraining stereophotogrammetry, in the form of load-displacement curves. We found that the curves were nonlinear. The most dramatic change due to modification in posture was found in coupled sagittal plane rotation, which changed from extension at extended posture to flexion at flexed posture at both levels and in response to both load types. For the axial torque, the main axial rotation and coupled lateral bending changed little with posture. For the lateral bending moment, the main lateral bending rotation and coupled axial rotation decreased; the latter changed direction at C1-C2 as the spine was put into flexed posture. The motions for the right and left load applications generally were mirror images, except for the coupled sagittal plane rotations, which did not change with the direction of the load.

Disc degeneration and the young fast bowler in cricket

Elliott BC, Davis JW, Khangure MS, Hardcastle P, Foster D.
Clin Biomech 1993; 8:227-234.

Summary. Twenty-four male fast bowlers of mean age 13.7 years, who bowled competitively at a school and club level were selected from

five Western Australian schools. At the time of the testing all bowlers, who were bowling completely freely, underwent magnetic resonance imaging to detect the presence of intervertebral disc abnormalities. While these radiological data were being analysed, the players were filmed both laterally (200 Hz) and from directly above (100 Hz) as their front foot impacted a force platform during the delivery stride of the fast bowling action. In addition these bowlers performed selected physical capacity tests. The occurrence of abnormal radiological data were then used to group the bowlers (group 1, no abnormal features; group 2, disc degeneration and/or bulging on scan). A Mann-Whitney U rank test was then used to identify any significant differences ($P < 0.1$) between the groups for all dependent variables. Five of the subjects recorded abnormal magnetic resonance imaging scans of the lumbar spine, while nineteen recorded normal intervertebral disc, normal alignment of the lumbar spine, and no sign of spondylolisthesis. Bowlers who rotated the trunk to realign the shoulders to a more side-on position between back foot impact and front foot impact in the delivery stride were more likely to record abnormal intervertebral disc features.

Relevance. Results show that although 79% of these very young players have normal discs in the lumbar region, those who rotated the trunk to realign the shoulders to a more side-on position between back foot impact and front foot impact predisposed themselves to lumbar spine abnormalities. This type of trunk rotation has previously been shown to be a predisposing factor in the development of stress fractures and in the development of abnormal skeletal radiological features in the lumbar spine. Abnormalities to the spine have now been identified in early adolescence, and therefore coaches of young fast bowlers must ensure that trunk rotation to realign the shoulders to a more side-on orientation during the delivery stride must be kept to a minimum.

Measuring abdominal muscle weakness in patients with low back pain and matched controls: a comparison of 3 devices

Helewa A, Goldsmith CH, Smythe HA.
J Rheumatol 1993; 20:1539-1543.

Objective. To compare 3 hand held devices used to measure isometric abdominal muscle strength: the adapted sphygmomanometer, the vigorometer and the Penny & Giles myometer.

Methods. Subjects were men, aged 22 to 43 years. Fifteen had a history of low back pain and 18 age matched controls had no low back pain. The test position was a half situp at 45°, knees at 90°, feet secured. The single observer applied pressure with one of the devices downwards, just below the sternal notch, while the patient maintained that position. Order of methods was random, controlled by a series of 3 x 3 Latin squares. The vigorometer and myometer were calibrated to mm Hg. Even numbered subjects were tested twice; odd numbered subjects had their measurements timed.

Results. One subject was unable to complete the study. Subjects with low back pain had abdominal muscle strength 38.8 mm Hg lower than healthy controls [$F(1,62) = 72.84, P2 < 0.01$]. Order of measurements was similar [$F(2,62) = 1.19, P2 = 0.31$]; instruments differed [$F(2,62) = 27.94, P2 < 0.01$]. Duplicate readings were similar (mini-

mum $P2 > 0.01$); all 3 devices detected significant differences between the 2 groups ($P2 < 0.01$); mean measurement time was 19 s and time to measure with each device was similar ($P2 = 0.70$).

Conclusion. All 3 instruments performed equally well. Since the sphygmomanometer is available at about 1/5 the cost of the vigorometer and 1/12 the cost of the myometer, it is the preferred instrument.

Treatment of disc herniation and fragmentation by spinal extension distraction

Taylor DN. *Chiropractic Technique* 1993; 5(3):111-118

A single case study is reported on a patient with two herniated discs and subsequent disc fragments that have compromised 50% of the spinal canal and resulted in associated nerve root signs and symptoms. A time course of extension distraction was performed resulting in symptomatic relief and significant loss of gadolinium-enhancing inflammatory material in the spinal canal as demonstrated on pretreatment and post-treatment magnetic resonance imaging. The differential diagnosis of space occupying lesions is emphasized.

Chiropractic holism: interactively becoming in a reductionist health care system

Jamison JR. *Chiropr J Aust* 1993; 23:98-105.

Contemporary chiropractic holism is a construct which is interactively evolving as chiropractors practise within a largely reductionist health care system. Chiropractic holism, while it may encompass conventional holism with its multifactorial approach and focus on the individualisation of patient care, can be differentiated from conventional holism through the global response anticipated to result from chiropractic manual intervention. Dominant features of chiropractic holism would furthermore appear to focus on the dynamic nature of patient-practitioner interaction, the educational commitment of practitioners and the regular use of exercise prescriptions which further ensure that patients become active partners in the healing process. The practitioner's perception that chiropractic intervention will enhance the patient's global wellbeing is an essential component of chiropractic holism and consistent with traditional chiropractic philosophy.

Cervical spine intervertebral kinematics for females suffering from headaches: a preliminary study

Brodeur RR, Wallace HL. *Chiropractic: Journal of Chiropractic Research and Clinical Investigation* 1993; 8(4):73-77.

The purpose of this project was to investigate the location of the center of rotation and measure the range of motion (ROM) of each vertebral joint in the cervical spine of females suffering from headaches. Lateral cervical flexion-extension examination using videofluoroscopy were performed on ten subjects suffering from chronic headaches. These examinations were recorded on a super-VHS video recorder. Two video

frames from each examination were captured using a video capture board. One frame was captured with the subject on full flexion, the second with subject in full extension. The captured frames were displayed on a computer monitor and the positions of four bony landmarks were recorded for each vertebra from C1-C7. The change in the angle from flexion to extension, the translation of the center of the vertebral body, and the location of the center of rotation were calculated from the above data.

Published findings for asymptomatic females show an increase in the ROM in the lower cervical spine compared to the upper cervical spine. Our sample of headache subjects had an increase in the ROM of the upper cervical spine and a decrease in the ROM of the lower cervical spine. These findings strengthen the hypothesis that the cervical spine may be a factor in the etiology of headaches; however, a study involving a larger group of subjects is needed to verify these results.

The reliability of muscle testing response to a provocative vertebral challenge

Haas M, Peterson D, Hoyer D, Ross G. *Chiropractic Technique* 1993; 5(3):95-100.

The inter- and intraexaminer reliability of muscle testing response to a provocative vertebral challenge in symptomatic and asymptomatic subjects was investigated using a double-blind within-subjects (repeated measures) design. Sixty-eight naive volunteers were recruited from the campus community and evaluated by two experienced physicians at the college's Center for Technique Research. The provocative vertebral challenge consisted of a standardized force of 4-5 kg applied with a 1-cm² rubber-tipped pressure algometer on the lateral aspect of the spinous processes of T3-T12. Following each challenge, piriformis was tested for a decrease in muscle resistance and a dichotomous response, yes or no, was recorded. In the population under study, both inter- and intraexaminer reliability showed that agreement could be attributed to chance alone ($\kappa \approx 0.00$). Although agreement on negative tests was high (~90%), agreement on the presence of muscle response was poor (5-10%). The usefulness of muscle testing as a diagnostic test for manipulable subluxion in asymptomatic and mildly symptomatic patients must be questioned. Further study is required on more symptomatic patients, different spinal regions, different muscles, and the effects of extraneous physiological processes on muscle response.

Short/long lever, nonspecific contact, articular chiropractic technique: a review of the literature

Bergmann TF. *Chiropractic Technique* 1993; 5(3):107-110.

An attempt is made to identify what has been theorized and/or written about the manual techniques generally classified as direct but using nonspecific contacts and/or short or long levers while using forces that may vary in speed and amplitude. A search of the MEDLINE bibliographic database using MeSH key words (Chiropractic/Methods;

Osteopathic Manipulation) was searched. The Index to Chiropractic Literature and Chiropractic Research Abstracts Collection (CRAC) was searched for the past 10 years using the key terms of Chiropractic-Methods; Chiropractic Techniques; Manipulation, Chiropractic; Manipulation, Osteopathic, Manipulation, Spinal; and Manipulation, Joint. A hand search of textbooks was undertaken as well as review of the references included in books, monographs, and collected papers. Very little was found or assessable with traditional methods of literature retrieval. Lack of common terminology as well as multiple technique developed in isolation have contributed to the problem. Descriptions of characteristics for the attributes of techniques that use nonspecific contacts in combination with short and long levers are provided along with comparisons of terms that have similar meanings. Where statements are made on appropriateness or effectiveness, they consist of opinions only with no references to any form of inquiry or testing.

Chiropractic care parameters for common industrial low back conditions

Mootz RD, Waldorf VT. *Chiropractic Technique* 1993; 5(3):119-125.

A detailed description of chiropractic care parameters used at a large occupational medicine center is presented. The algorithms were derived from clinical needs of the facility, expert opinion, and reviews of several contemporary written protocols. Twelve of the most common industrially related low back conditions are included. The algorithms are grouped according to nondiscogenic and discogenic conditions. The guidelines are consistent with many third party chiropractic review policies as well as the recently published Chiropractic Quality Assurance Guidelines and Practice Parameters. The first algorithm is based on uncomplicated joint dysfunction and is considered the base algorithm. Other more complicated conditions follow, and a preface is included for each describing specific issues relevant to each condition. The purpose of these algorithms was to help standardize care in the clinic to foster interdisciplinary communication and provide consistency in administration for research purposes.

A descriptive report of the case-mix within Australian chiropractic practice, 1992

Ebrall PS. *Chiropr J Aust* 1993; 23(3):92-97.

The objective of this study was to generate a description of the case-mix of chiropractic practice in Australia by using a prospective recording instrument provided to volunteer chiropractors. The 25 respondents were located in private practice throughout six of the eight jurisdictions in Australia. They were members of the Chiropractors' Association of Australia and recorded details of 100 consecutive patient visits from Monday, 7 September 1992. A total of 2,500 patient visits were recorded. Of these 1,148 (46%) were made by males and 1,352 (54%) by females. There were 246 (9.8%) new patient visits and 2,254 (90.2%) return patient visits. The mean age of patients was 39.45 years, and half of the patient visits were generated by patients in the age range of 30 to 50 years. The presenting complaint was back pain in 41% of

patient visits, neck pain in 23%, and headache in 14%. There were 85 (3.4%) patient visits at which an apparently non-musculoskeletal presenting complaint was reported. Patients with workers' compensation accounted for less than 10% of all visits. Slightly over half of all visits were funded by a private health fund, with the highest percentage being in South Australia (76.8%) and Western Australia (74.3%), falling to 25% in the ACT. This study is an early attempt to define case-mix of Australian chiropractic practice, and concludes that chiropractors mostly treat musculoskeletal complaints where the patient is reimbursed for the cost of treatment by a third party. The proportion of non-musculoskeletal diagnoses, while very small, can be seen as demanding the retention of differential diagnostic skills by chiropractors, even though the number of patients with a primary presenting complaint of a visceral nature is extremely small.

Pain drawing analysis: a review

Bryner P. *Chiropr J Aust* 1993; 23(3):86-91.

Drawings of pain by patients using body outlines is an adjunct to other forms of assessment of musculoskeletal pain. Drawings are analysed for their anatomical appropriateness, based on the assessors knowledge of the sources of pain from the back. New information about sources of pain needs to be incorporated into such systems of analysis. Where an appropriate pattern is lacking, or other marks made (like arrows or unsolicited comments) it has been assumed that psychological involvement is likely. A number of studies have used this approach in studying back pain. These results are reviewed along with the reliability of this method of assessment which is generally high. The instructions, and the criteria used to score drawings vary from study to study. The other main form of pain drawing analysis is that assessing the area involved. The number of sections of the body affected by pain is used to estimate the area. The number of body sections ranges from 27 to 15,000. Computers are now being used for analysing drawings and predicting a diagnosis. These forms of assessment have high levels of inter-rater agreement. Crude forms of pain distribution analysis do not seem to be responsive to changes in clinical status. It has yet to be shown that greater accuracy in assessment will show adequate responsiveness in patients undergoing treatment. Pain distribution is a promising area for further research in a chiropractic setting because it may prove to demonstrate change over time with treatment. Pain drawings could be used to demonstrate improved patient care.