

Health promotion and disease prevention – a rational approach to screening in chiropractic clinics

Jamison J. *J Aust Chiro Assoc* 1988; 18:25–28.

The expectation that chiropractors participate in preventing disease and promoting the health of the community is increasingly becoming a reality as functional integration of chiropractors as primary contact practitioners within the orthodox health care system is increasingly realised. This paper demonstrates how a set of screening criteria may be used to selectively determine which conditions are suitable for routine screening by chiropractic clinicians. It is suggested that the efficiency of the chiropractor's health promotion and disease prevention endeavours can be maximised using this approach.

Postmyelographic cauda equina syndrome in an asymptomatic acquired spinal stenosis of a young acromegalic

Woo C. *JMPT* 1988; 11:118–123.

Early postmyelographic cauda equina syndrome in an asymptomatic young acromegalic is presented. The patient was asymptomatic for more than 1 year despite myelographic evidence of acquired spinal stenosis at the L2-L4 level. Radiographic and/or myelographic findings should be clinically correlated. It is postulated that, in acromegaly, the combined simultaneous bony apposition-remodeling resorption mechanism is involved in the spine as platyspondyly, hyperostosis of spinous processes and vertebral scalloping to counteract soft tissue hyperplasia within the spinal canal; entrapment myelopathy, cauda equina syndrome and/or radiculopathy are ascribed to a soft tissue edematous mechanism superimposed on congenital or degenerative spinal stenosis, traumatic or postoperative spondylolisthesis, postmyelographic and/or postoperative arachnoiditis and a traumatic swollen or protruded intervertebral disc.

Chiropractic management of spondylolisthesis with spondylolysis of the pars interarticularis: an example of the single-case study experimental design

Crawford J, Noble W, Vernon H. *JMPT* 1988; 11:89–93.

Case records permeating the chiropractic literature, although claiming success utilizing conservative therapies, often are founded on isolated circumstances rather than scientific data. A detailed examination of such reports reveals a void with respect to definitive and specific approaches for the diagnosis and clinical management of disorders synonymous with chiropractic clinical practice. At best, therefore, such reports are fraught with empiricism, illustrating only the experiences of individual clinicians. The underlying difficulty encountered in reporting information on purely didactic grounds is likely due to the absence of a mechanism by which improvement in biomechanical function may be precisely and adequately quantified. In direct contrast, controlled clinical trials, as in medical research, offer the luxury of statistical clarity as to the selection of one treatment regimen over another.

Researchers have indicated that the single-case study experimental

design may be of value in chiropractic clinical practice, allowing for the formulation of deductive conclusions derived from each case. To facilitate the process, implementation of both retrospective and prospective aspects are proposed modifications to the general scheme.

It is the purpose of this article to employ the concept of the single-case study experimental design, illustrating a condition commonly encountered in chiropractic clinical practice, that of spondylolisthesis. In so doing, we attempt to adhere to the prescribed format, while outlining both the retrospective and prospective aspects, commensurate with such a problem within the clinical setting.

The impact of AIDS in the pediatric and adolescent populations

Dekker A. *JAOA* 1988; 88(5):629–633.

Although pediatric and adolescent AIDS cases comprise only 1.9% of the national total AIDS population, the numbers are increasing rapidly. As there appears to be no effective treatment for these patients, an aggressive preventive approach is needed. Pediatrics AIDS diagnosis and symptomatology differ from the adult population. Vaccination protocols for symptomatic HIV-infected children differ from their uninfected peers. Adolescent issues of sexual activity, sexual exploitation, and chemical abuse raise the probability of spread in this population.

Isokinetic trunk and lifting strength measurements: variability as an indicator of effort

Hazard R, Reid S, Fenwick J, Reeves V. *Spine* 1988; 13(1):54–7.

This study examines the hypothesis that force/distance curve variability distinguishes submaximal from maximal efforts in isokinetic trunk and lifting strength tests. Thirty normal subjects were tested on the Cybex Trunk Extension/Flexion (TEF) and Lifttask (LT) machines during maximal (100%) and submaximal (50%) efforts. Considering each test separately, visual assessments of curve variability were indeterminate of degree of effort in 28% of TEF and 34% of LT tests. Measurement models of curve variability were more clearly discriminating. When a given subject's test curves were considered together, scaled visual assessments identified the degree of efforts in 91% of TEF and 86% of LT results. The measurement models were accurate 90–92% of TEF and 79–92% of LT results. Clinical judgment is required in evaluating effort during tests of isokinetic trunk and lifting strength.

KEY WORDS: isokinetic, trunk strength, curve variability, effort rating.

Demographic and practice characteristics of chiropractors

Baffi C, Redican K, Morris L, Schroeder K, Olsen L. *JMPT* 1988; 11:85–88.

The purpose of this study was to determine the demographic and practice characteristics of chiropractors. A four-part survey questionnaire was developed and mailed to a national stratified (by state) random

sample of chiropractors. The analysis of data revealed that most chiropractors hold an undergraduate degree, practice in an urban area, are licensed to practice in only one state, belong to their state's chiropractic association, and are active in continuing education. Other data analyzed related to income, sources of new patients and average fees charged.

Spontaneous dissections of the vertebral arteries

Mokri B, Houser W, Sandok B, Piepgras D.
Neurology 1988; 38:880-885.

Clinical and angiographic features and outcome in 25 patients with spontaneous dissections of the vertebral arteries described. Most patients were in their fourth or fifth decade of life, and women predominated. Forty-eight percent of the patients were hypertensive. Angiographic evidence of fibromuscular dysplasia was noted in one only. Brainstem ischemic symptoms (usually a lateral medullary syndrome) and ipsilateral occipital headache and neck pain (often preceding but sometimes associated with or following the brainstem ischemic event) were the most common clinical findings. The angiographic features in decreasing order of frequency were luminal stenosis (often irregular and tapered), aneurysm, occlusion, and intimal flap. On follow-up, most of the patients (88%) made complete or very good recoveries. Angiographic abnormalities either subsided or improved in 76%. Multivessel dissection (involvement of both vertebral arteries or one or both vertebral arteries and one or both internal carotid arteries) was noted in about two-thirds of the patients. This tendency of vertebral artery dissections to involve multiple cervicocephalic vessels concurrently, if not simultaneously, implies that four-vessel angiography should be attempted if a vertebral artery dissection is visualized. It also raises the possibility of an underlying arteriopathy that predisposes the vessel to dissection.

Does the MMPI predict chemonucleolysis outcome?

Herron L, Turner J, Weiner P. Spine 1988; 13(1):84-8.

Ninety-one patients with lumbar disc herniation were treated by chemonucleolysis with intradiscal chymopapain injection and evaluated at least 1 year after surgery (average, 18 months). There were 54 good, 10 fair, and 27 poor results after chemonucleolysis. Good versus fair/poor outcome groups differed preoperatively on the Minnesota Multiphasic Personality Inventory (MMPI) Hypochondriasis (Hs), Hysteria (Hy), Psychopathic Deviate (Pd), Paranoia (Pa), Hypomania (Ma), and Social Introversion (Si) scales. Presence of compensation issues at the time of surgery was significantly related to outcome, and the MMPI scales provided additional predictive power. Nineteen patients who did not show improvement with chemonucleolysis subsequently underwent lumbar laminectomy and discectomy, and the ultimate outcome for the entire series including these laminectomy patients was 66 good, 10 fair, and 15 poor results. Good versus fair/poor ultimate outcome patients differed significantly on preoperative MMPI Hypochondriasis, Hysteria, Psychopathic Deviate, Paranoia, Psychasthenia, Schizophrenia, Hypomania, and Social Introversion scales. After controlling for the effects of compensation issues, MMPI scales added significantly to the ability to predict ultimate surgical outcome. However, the MMPI could

not be used with confidence to predict the outcome for a given patient and should serve only to alert the surgeon to the presence of psychological risk factors and the possible need for referral for psychological evaluation and treatment.

KEY WORDS: lumbar disc herniation; chemonucleolysis, MMPI, compensation, prediction of outcome.

Dissection of the intracranial vertebral artery

Caplan L, Baquis G, Pessin M, D'Alton J, Adelman L, DeWitt L, Ho K, Izukawa D, Kwane E. Neurology 1988; 38:868-877.

We describe four patients and review prior reports to clarify the clinical, radiographic, and pathologic findings of intracranial vertebral artery (VA) dissection. A 43-year-old man and a 33-year-old woman had chronic bilateral VA dissecting aneurysms. The man had multiple episodes of subarachnoid hemorrhage (SAH) and necropsy showed multiple dissections and defects in the internal elastica. The woman had many brainstem TIAs and strokes during 3 years. Two other patients had SAH and unilateral dissections. Intracranial VA dissection causes four overlapping syndromes: (1) brainstem infarcts are usually due to subintimal dissection extending into the basilar artery, affect younger patients, and often are single fatal events; (2) SAH is due to subadventitial or transmural dissection; (3) aneurysms cause mass effect on the brainstem and lower cranial nerves; and (4) chronic dissections due to connective tissue defects cause extensive bilateral aneurysms and repeated TIAs, small strokes, and SAH.

Stages in the natural history of the vertebral end-plates

Edelsonm J, Nathan H. Spine 1988; 13(1):21-6.

Four hundred and fifty skeletons were examined, and age changes in the bony vertebral end-plates were grouped into six categories. The predominant patterns of each phase from infancy to senescence are presented. The formation of ridges and sulci that form peripherally are similar to those appearing in other epiphyses and may provide translational stability. When osteophytes appear with maturation, they are separated from the fused ring apophysis by a distinct sulcus.

KEY WORDS: vertebral end-plates, epiphysis, developmental anatomy, ring apophysis, osteophytes.

Posterior tibial tendon rupture

Kerr H. Ann Emerg Med 1988; 17:649-650.

A patient initially presented with pain in the instep and medial malleolar area swelling after an eversion injury. The pain was described as "fiery" and failed to resolve with conservative measures. Ankle and foot radiographs were normal. The patient returned several weeks later with complaints of continued pain and of disturbed gait, the latter due to unilateral flatfoot and a sensation of loss of control of the foot. At surgery an incompetent posterior tibial tendon was found and repaired.

Atlantoaxial subluxation in Reiter's Syndrome a report of three cases and review of the literature

Kransdorf M, Wehrle P, Moser R. Spine 1988; 13(1):12-14.

Three patients with the unusual manifestation of atlantoaxial subluxation in Reiter's syndrome are studied. Each patient had mild symptoms referable to the cervical spine and radiologic evidence of erosive disease elsewhere in the skeleton. One patient had an 11-year history of Reiter's syndrome when the atlantoaxial subluxation was detected. The other two had atlantoaxial subluxation detected within 1 year of initial presentation, at variance with three other such patients that were reported previously, in whom there was a 6- to 10-year interval from initial presentation until radiographic documentation of atlantoaxial subluxation. Cervical spine radiographs, including flexion and extension views, are recommended for all patients with Reiter's syndrome and cervical spine symptoms.

KEY WORDS: Reiter's syndrome, arthritis, atlantoaxial subluxation, atlantoaxial subluxation in Reiter's syndrome.

Clinical and angiographic comparison of asymptomatic occlusive cerebrovascular disease

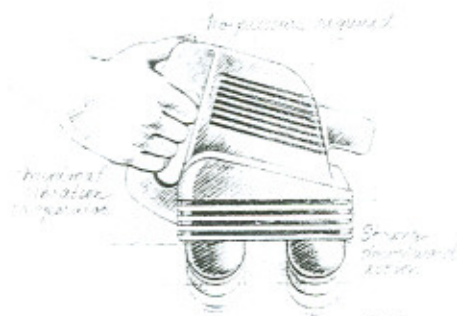
Gorelick P, Caplan L, Langenberg P, Hier D, Pessin M, Patel D, Taber J. Neurology 1988; 38:852-858.

We compared clinical and arteriographic features in 106 patients with symptomatic unilateral carotid territory occlusive disease to determine the frequency and distribution of occlusive arterial lesions in asymptomatic vessels. Among black patients who were predominantly from Chicago, young, and female, there were fewer transient ischemic attacks and myocardial infarcts, less claudication, and more asymptomatic lesions of the supraclinoid internal carotid artery, anterior cerebral artery stem, and the middle cerebral artery stem. Among white patients predominantly from New England, elderly, and male, there was more frequent and severe occlusive asymptomatic disease at extracranial carotid and vertebral artery sites. Knowledge of the distribution of asymptomatic lesions will help guide evaluation and treatment strategies for patients with occlusive cerebrovascular disease.

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Transient CNS deficits: a common, benign syndrome in young adults

Levy D. *Neurology* 1988; 38:831-836.

The incidence of transient (< 24 hour) neurologic loss was evaluated from a survey returned by 80/87 members of Cornell's Department of Neurology. Transient CNS dysfunction was reported by 25/80 (32%; 95% confidence interval, 21 to 44%). In most (15) only vision was affected, but ten (13%; 6 to 23%) reported nonvisual deficits. In nine of these ten, loss of power, balance, or coordination was noted, sometimes with other symptoms (visual in two), and the tenth subject had speech arrest. Seven of the ten had more than one episode. Episodes in these ten individuals began at age < 30 in four, 30 to 34 in five, 35 to 39 in none, and 40 to 44 in one. The reported frequency of migraine was nonsignificantly higher in patients with nonvisual (4/10, 40%) or visual 7/15, 47%) episodes than in respondents without episodes (12/55, 22%; $\chi^2_1 = 4.3$). Except for inflammatory bowel disease on one respondent, no obvious cause of the nonvisual episodes was evident from follow-up structured interviews. Five of the ten with nonvisual loss and eight of the 15 with isolated visual symptoms thus had no obvious cause for their episodes. Follow-up is limited to a median of 5 years, but none of the 25 has had any residual deficit or chronic neurologic disorder, suggesting that these relatively common episodes of CNS deficit are benign. As new, hyperacute stroke therapies emerge, efforts to distinguish these episodes from true, early strokes will become increasingly important.

Static and dynamic components of the chiropractic subluxation complex: a literature review

Dishman R. *JMPT* 1988; 11:98-107.

Intervertebral dysfunction refers to a biomechanical fault which is abnormal in both its dynamic and static components. A subluxation may be considered as being fixated and also slightly malpositioned in one or more axes of rotation.

Subluxation may be considered as one component of a complex or syndrome of intervertebral dyskinesia, dysarthrosis or dysfunction. The biochemical and histological components explain some of the pain mechanisms, tissue changes and residual effects of acute and chronic intervertebral fixation and the need for repeated spinal manipulations and prolonged care. Interexaminer reliability studies indicate that a standard method of motion palpation is quite feasible and accurate. X-ray evidence of dyskinesia shows promise as a means of documenting subluxation fixations.

The lumbar facet syndrome

Helbig T, Lee C. *Spine* 1988; 13(1):61-4.

A clinical study was undertaken to formulate better criteria for accurate diagnosis of the lumbar facet syndrome and for predicting treatment response to facet joint injection. Twenty-two consecutive patients with a clinical diagnosis of lumbar facet syndrome, made by conventional diagnostic criteria, who were then treated with facet joint injection, were reviewed for their treatment responses. New diagnostic criteria

were formulated based on a scoring system derived from the values observed in this review study. The scoring system has a total of 100 points, allocated as follows: back pain associated with groin or thigh pain, 30 points; well-localized paraspinal tenderness, 20 points; reproduction of pain with extension-rotation, 30 points; corresponding radiographic changes, 20 points; and pain below the knee, -10 points. A score of 60 points or more indicates a very high probability of satisfactory response to facet joint injection (100% prolonged response in this study). When only the conventional criteria were used, the overall results of prolonged relief of pain after facet joint injection was 50%. A "scorecard" system is proposed that may give a higher degree of diagnostic accuracy and predictability of successful response to facet joint injection.

KEY WORDS: low-back pain, facet syndrome diagnosis, facet injection, treatment response.

Posterior spinal fusion in scoliosis: computer-assisted tomography and biomechanics of the fusion mass

Zagra A, Lamartina C, Pace A, Balzarini E, Zerbi A, Scoles P, Ajello F, Mazzarella P, Pillitteri G. *Spine* 1988; 13(2):155-161.

Thirty patients who had posterior vertebral fusion for scoliosis, performed without metallic implants, were examined using computer-assisted tomography to study the configuration of the evolving fusion mass. It was observed that the deposition of bone followed lines of force, according to Wolff's Law. The greatest amounts of bone at the apex of the curve on the concave side indicate that flexion-compression forces are greater at this point. Further, it was observed that usually the fusion mass, seen in section, has a hollow "box-section" shape, which means that a resorption of unstressed central bone occurs. The hypothesis that the torsional forces are the predominant forces acting on the scoliotic spine can explain the characteristic "box-section" of the CT scans obtained.

KEY WORDS: scoliosis surgery, CT evaluation, fusion mass.

Determinants of disability in rheumatoid arthritis

McFarlane A, Brooks P. *Br J Rheu* 1988; 27:7-14.

The longitudinal determinants of disability were studied in a group of 30 patients with rheumatoid arthritis over a 3-year period. The patients were investigated on two occasions using quantitative measures of disease activity and disability as well as a series of reliable psychometric instruments. Both longitudinal and cross-sectional data analyses were performed. Psychological factors consistently predicted more of the variance of disability than disease activity. These factors were associated with the tendency to deny the emotional dilemmas caused by having a chronic illness, difficulty in accepting doctors' reassurances and clinical depression. Such psychological variables required specific attention in rehabilitation programmes.

Treatment of symptomatic flatback after spinal fusion

Lagrone M, Bradford D, Moe J, Lonstein J, Winter R, Oglivie J.
J Bone Jt Surg 1988; 70A(4):569-580.

Fifty-five patients who had loss of lumbar lordosis after spinal fusion and subsequently had corrective osteotomies were studied. When they were first seen, fifty-two patients (95 per cent) were unable to stand erect and forty-nine (89 per cent) had back pain. The previous use of distraction instrumentation with a hook placed at the level of the lower lumbar spine or the sacrum was the factor that was most frequently identified as leading to the development of the flatback syndrome. Sixty-six extension osteotomies were performed in these fifty-five patients. Nineteen patients (35 per cent) had an associated anterior spinal fusion. Thirty-three patients (60 per cent) had one or more complications, including pseudarthrosis, a dural tear, failure of hardware, neurapraxia, and urinary tract infection.

The results of the operation were evaluated at follow-up by review of clinical records, radiographs, and questionnaires. At an average follow-up of six years (range, two to fourteen years), most patients felt that they had benefited from the corrective osteotomies. However, twenty-six

patients (47 per cent) continued to lean forward and twenty patients (36 per cent) continued to have moderate or severe back pain. The failure to restore sagittal plane balance led to a higher rate of pseudarthrosis, which was associated with recurrent deformity. Anterior spinal fusion combined with posterior osteotomy resulted in greater maintenance of correction.

The prevention of flatback syndrome is important, since its treatment is difficult. When a spinal fusion must be extended to the level of the lower lumbar spine or the sacrum, the use of distraction instrumentation should be avoided in order to prevent this deformity.

On the origin of head pain

Raskin N. Headache 1988; 28:254-257.

Clinical, pharmacological and biochemical evidence converge upon perturbed serotonergic neurotransmission as putative mechanism of headache. The evidence is reviewed, drawing upon the clinical examples of cerebral infarction, arteriovenous malformation, migraine and cluster headache. Ordinary, periodic headache may be the "noise" of serotonergic neurotransmission.

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Fracture of the posterior margin of a lumbar vertebral body

Takata K, Inoue S, Takahashi K, Ohtsuka Y.
J Bone Jt Surg 1988; 70A(4):589-594.

Using computed tomography, we studied twenty-nine patients who had thirty-one fractures of the posterior margin of a vertebra in the lumbar spine. Based on our findings, these fractures were classified morphologically into three types: a simple separation of the entire margin; an avulsion fracture of some of the substance of the vertebral body, including the margin; and a more localized fracture. In this series, twenty-two of the thirty-one fractures were associated with a defect involving the affected end-plate. This fact suggests that the pathogenesis of these fractures may be the fragility of the end-plate.

The innervation of the cervical intervertebral discs

Bogduk N, Windsor M, Inglis A. Spine 1988; 13(1):2-8.

Microdissection and histologic studies were undertaken to determine the innervation of the intervertebral discs. The cervical sinuvertebral nerves were found to have an upward course in the vertebral canal, supplying the disc at their level of entry and the disc above. Branches of the vertebral nerve supplied the lateral aspects of the cervical discs. Histologic studies of discs obtained at operation showed the presence of nerve fibers as deeply as the outer third of the annulus fibrosus. These anatomic findings provide the hitherto missing substrate for primary disc pain and the pain of provocation discography.

KEY WORDS: cervical intervertebral disc, innervation, sinuvertebral nerve, annulus fibrosus, cervical disc pain.

Visit characteristics of 217 children attending a chiropractic college teaching clinic

Nyiendo J, Olsen E. JMPT 1988; 11:78-84.

The visit characteristics of 217 children attending a chiropractic teaching clinic are described. Forty-two percent suffered from musculoskeletal complaints, 20% from nonmusculoskeletal complaints and 33% attended the clinic for general physical examination. Patients who were members of the immediate family of a student intern were more likely to attend the clinic for general physical examination or for nonmusculoskeletal complaints. Previous experience with chiropractic was unrelated to the type of complaint, and, among children who had sought previous care for their presenting complaint from some other source, they were as likely to have seen a chiropractor as a medical doctor, regardless of the nature of their complaint. The study concludes that the characteristics of this patient group may be unique to the teaching clinic, reflecting a system in which friends and family are often recruited as patients. These patients might be more likely to view chiropractic care as a primary health care service.

Superior new acupuncture method for the treatment of low back pain

Takase K. AM J Acupunct 1986; 14(3): 243-7.

As a method of treating lumbar pain, epidural block therapy is now frequently practiced, requiring a highly skilled technique which, however, is often accompanied by undesirable side effects and uncertain therapeutic results. In contrast, with the method described here, every primary lumbar pain can be treated effectively and almost without fail. Based on a little known acupuncture technique of the Japanese Ishizaka school which teaches that acupuncture stimulation is but a supplement to stimulation of a nerve whose function can cure diseases, any physician - even if inexperienced - can obtain most gratifying therapeutic results with this treatment modality.

Blood flow imaging of a posterior circulation stroke

Foster N, Mountz J, Bluelein L, Ackermann R, Petry N, Kuhl D.
Arch Neurol 1988; 45:687-690.

Regional cerebellar perfusion was imaged using technetium Tc 99m hexamethylpropylene amine oxime and single photon emission computed tomography (HM-PAO-SPECT) in a patient with chronic left lateral medullary syndrome with contralateral weakness due to traumatically induced thrombosis of the left vertebral artery. Despite continued neurologic deficits, x-ray transmission computed tomography was normal. However, HM-PAO-SPECT demonstrated that blood flow to the left cerebellar hemisphere was significantly impaired. This abnormality was still apparent after correction for atrophy as estimated by magnetic resonance imaging. Technetium Tc 99m hexamethylpropyleneamine oxime and single photon emission computed tomography effectively imaged regional blood flow in the vertebrobasilar circulation and appears to more clearly reflect the nature and extent of the neurologic deficit than either x-ray transmission computed tomography or magnetic resonance scanning.

Transient ischemic attacks and stroke

Mirsan T, Hachinski V. CMAJ 1988; 138:1099-1105.

Transient ischemic attacks (TIAs) constitute the most specific and powerful warnings of impending stroke. They are defined as brief, focal neurologic events of sudden onset. Their proper recognition and treatment rank second only to the modification of risk factors in importance for stroke prevention. Carotid endarterectomy, although widely used to treat TIAs, remains unproven; randomized clinical trials are attempting to define its role. Anticoagulant therapy appears worth while for suspected cardiac embolism and possibly for disabling TIAs. Acetylsalicylic acid is the only agent that has been found to be effective in controlled trials, but questions persist about its dosage, its efficacy in women and its use after stroke. Another platelet inhibitor, ticlopidine hydrochloride, is being investigated and may prove to be an effective alternative.

Informed consent and provider-patient relationships in rehabilitation medicine

Caplan A. Arch Phys Med Rehabil 1988; 69:312-317.

The legitimacy of paternalism on health care relationships has been severely criticized by those in the field of medical ethics. Critics have argued that paternalism has no place in physician/patient encounters. Patients must always be treated as autonomous agents, capable of directing the course of their medical care. Informed consent has come to represent the mechanism through which autonomy can best be assured in medical relationships. If provider/patient interactions are viewed as a contract between consenting agents, then providers are obligated to obtain informed consent for all interventions they wish to undertake. This view, however, relies upon examples of care provided to those with acute medical problems. In rehabilitation, it can be argued that for some patients at some times during their care, a contractual model would be inappropriate. Especially when patients have undergone a sudden and unexpected course of severe impairment, it is difficult to conceptualize provider/patient relationships in the context of a contract. Providers are more accurately seen as acting in educational roles toward those in their care. If this is so, then there may be instances in which paternalistic behavior toward rehabilitation patients is ethically justified. Informed consent must be carefully examined if it is to be a useful doctrine in the context of rehabilitative care.

Lumbar disc degeneration: correlation with age, sex, and spine level in 600 autopsy specimens

Miller J, Schmatz C, Schultz A. Spine 1988; 13(2): 173-8.

Using data from 16 published reports, the authors correlated macroscopic disc degeneration grades with age, sex, and spine level in 600 lumbar intervertebral discs from 273 cadavers (ages: 0-96 years). Male discs were more degenerated than female discs at most ages; significantly so in the second, fifth, sixth, and seventh decades. On average, L4-L5 and L3-L4 level discs showed more degeneration than discs at the other lumbar levels. These macroscopic findings corroborate radiographic data from epidemiologic studies. The calculations suggest that higher mechanical stress, perhaps combined with longer nutritional pathways, may be responsible for the earlier degeneration of male discs.

KEY WORDS: lumbar intervertebral disc, macroscopic degeneration, age, sex, spine loads.

Biomechanics of forward-reaching movements while sitting on fixed forward- or backward-inclining or tiltable seats

Bendix T, Jessen F, Krohn L. Spine 1988; 13(2):193-196.

Possible differences in spinal stress were evaluated during forward-reaching movements from chairs with, respectively, fixed backward-inclining, forward-inclining, and tiltable seat. Twenty-four healthy subjects, 12 female and 12 male, performed rhythmical sagittal movements with pins over a 40-cm distance. The posture in an upright and in

a forward position was described by means of seven variables, measured by an inclinometer. Posture changes between these positions were then compared for three types of chairs. No significant influence from the chairs on posture changes was observed. Thus, no variation in spinal stress can be anticipated during forward-reaching movements in any of the three types of chair. The discussion also presents a current status regarding tiltable and fixed forward-inclining seats.

KEY WORDS: ergonomics, forward flexion, human engineering, sitting posture, spine, tiltable chair.

Athletic low back pain originating from the neural arch

Banks S. Chiro Sports Med 1988; 2(2):51-54.

The causes of athletic low back pain are reviewed. The lumbar neural arches are uniquely susceptible to injury in sports involving trunk extension. The majority of cases involved mechanical joint pain and is usually resolved with manipulation. Failure of response to initial treatment should illicit a systematic process of diagnostic imaging to evaluate bony injury.

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