The Chiropractic Report

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Professional Notes

Salt Lake City. Each Olympic Games sees a steady growth in chiropractic services, largely because of pressure from the many athletes who make regular use of chiropractic care— and the always exciting and sometimes controversial Salt Lake City winter games last month were no exception. Many national teams had chiropractors on their health care staffs.

The US team chiropractor was Dr. Robin Hunter of Columbus, Ohio. One of the athletes with whom Dr. Hunter worked extensively was speedskater Derek Parra, who is sponsored by the American Chiropractic Association. Parra, whose regular chiropractor is Dr. Keith Overland of Norwalk, Connecticut, broke the world record in winning a gold medal in the 1500 meters. He also won the silver medal in the 5000-meter race.

Canadian team chiropractors were Dr. Brian Seaman of Halifax, Nova Scotia and Dr. Greg Uchacz of Calgary, Alberta who report working long and satisfying hours with, amongst others, members of the hockey, freestyle skating, bobsled, luge and skeleton teams. Dr. Seaman

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A New Analysis of Work-Related Chronic Back Pain

Current Pain Theory, Fair Compensation, Chiropractic Management

CHRONIC BACK PAIN, pain persisting for more than three months and often for years, is one of the major health and cost issues in industrial countries. The annual cost to employers and workers' compensation plans is staggering — 20 years ago best estimates of the annual cost of back pain were $50 billion in the US[1] and £1000 million in the UK.[2] But the real seriousness of the problem was that:

a) 85% of that cost was for the 5-10% of back pain patients who developed chronic pain and disability.[3]

b) Understanding of the nature and origin of pain, and therefore the best methods of managing patients, was poor. There was little formal evidence of the effectiveness of any treatment, and studies showed that the average primary care physician felt unable to alter the natural course of back pain — to prevent acute pain from becoming chronic.[4]

c) Because of factors that included more sedentary lifestyles, increased stress, and this poor understanding and management of patients with chronic pain, there was an accelerating problem — in the past 10 years the US population had risen by 12.5% but those disabled by back pain had risen by 168%.[5,6]

2. Governments, employers funding workers' compensation plans, and patients were all dismayed by this situation. Health professionals acknowledged there was little evidence upon which to base 'evidence-based' care. Worldwide a serious new search for a better understanding of acute and chronic back pain and its management was underway.

Answering questions on acute pain was relatively easy, and by the mid-1990s there were evidence-based national guidelines in the US,[7] the UK,[8] and several other countries. All of these developed by representative panels of experts called for avoidance of rest, motivation of patients to maintain daily activities, and the use of manipulation and/or over-the-counter medications (e.g. NSAIDs) as preferred treatments to control pain and restore musculoskeletal function. Better management of acute pain is obviously the best way of avoiding chronic pain.

3. However the 5-10% of patients developing chronic back pain remained the cost center, and answering questions on chronic pain has been far more difficult. To tackle this problem the Ontario Workers' Safety and Insurance Board (WSIB), one of the largest workers' compensation agencies in the world, appointed an independent, multidisciplinary, chronic pain expert advisory panel (the Scientific Panel) in 1998 to provide a comprehensive report on the causes, treatment and disability management of chronic pain in occupational health, including chronic back pain.

The 11 members of the Scientific Panel represented the disciplines of acupuncture, anaesthesiology, chiropractic, epidemiology, family medicine, neurology, nursing, orthopaedics, physical medicine, physiotherapy, psychiatry, psychology and rheumatology. The chiropractic panelist was Silvano Mior, DC FCCS, Dean of Graduate Studies and Research, Canadian Memorial Chiropractic College, Toronto. The Scientific Panel was assisted in its systematic review of the scientific evidence by the Institute of Work and Health in Toronto, the Cochrane Collaboration's international center for the review of the back pain research.

The Scientific Panel's report, titled *Etiology, Prevention, Treatment and Disability Management of Chronic Pain* has just been published as a 134 page supplement in the December 2001 issue of *The Clinical Journal of Pain*,[9] a

leading peer-reviewed journal in this field, published quarterly in the US by Lippincott, Williams and Wilkins and with an international editorial board led by Dennis Turk, PhD from the University of Washington in Seattle.

This issue of *The Chiropractic Report* reviews important observations and findings of the Scientific Panel, including current evidence concerning the various treatment methods for patients with chronic back pain. Chiropractic management, it will be seen, scores comparatively high marks. We start, however, with the Scientific Panel's insights into former and contemporary concepts of chronic pain. Understanding the sources or etiology of pain is the necessary basis for choosing appropriate treatment options and for effective overall management of the multifactorial problem of disabling chronic pain.

B. Concepts of Pain

4. **Specificity Theory**. From the classical Greek era until recent times pain, and especially chronic pain, has been understood from two competing viewpoints — firstly as having a purely psychological origin (pain as emotion), and secondly as having a purely physical origin, with psychological processes seen as reactions to pain.

The physical/mechanistic approach, which tends to see pain as invalid if there is no discoverable physical basis, gave rise to the mid-19th century specificity theory, which postulated pain-specific nerves throughout the body which, when stimulated, necessarily gave rise to pain projected to the brain via the spinal cord. This theory, explains Warren Nielson, PhD in his early chapter of the Scientific Panel Report titled *The Concept of Pain*, was subsequently found to be simplistic and wrong because it could not explain many observations relating to pain, including:

- How severe injuries can cause relatively little pain.
- How pain can persist even after the injury was healed.
- How psychological factors (e.g. placebos, hypnosis) can influence pain.
- Why pain includes a wide range of sensations.
- Why the qualities and location of pain can change over time.
- How pain can be felt in a different location than the site of injury (e.g. referred pain).

5. **Summation Theory**. Through to the mid-20th century increased knowledge about the anatomy and physiology of pain led to the concept of central summation. Impulses from sensory nerves that detected harmful stimulation (nociceptors) converged in the spinal cord and brain (central nervous system — CNS). The result of this convergence and summation of noxious stimulation was the creation of reflex, self-exciting, continuing nerve loops in the CNS — this explained how chronic or long-term pain could arise from a brief period of nerve stimulation from an injury now healed.

6. **Sensory Interaction Theory**. In the 1950s Noordenbos was the first to propose an input control mechanism in the nervous system which, under normal circumstances, prevents central summation from occurring. Pain arose when this control mechanism was damaged. Fundamental to this new sensory interaction theory was the discovery that there are two types of peripheral nerves involved — small-diameter nerves conducting the impulses necessary to produce pain, and large-diameter nerves that inhibit these impulses. A significant number of impulses in small nerves produces a central summation experienced as pain, but greater activity in the competing or large nerves prevents or inhibits that pain.

7. **Gate Control Theory**. From the mid-1960s Melzack and Wall's gate control theory of pain[10] revolutionized understanding and research in pain theory. This built on Noordenbos' work and described a controlling or "gating" mechanism in the spinal cord which modulated the competing information from small and large diameter peripheral nerve fibers, and then governed another class of nerves that transmitted pain-related signals via the spinal cord to the brain where further processing and final perception of pain occurred. According to gate control theory, as Nielson further explains on behalf of the Scientific Panel, pain has three distinct dimensions:

- A sensory-discriminative dimension, involving the location, quality, and intensity of the painful sensation;
- A cognitive-evaluative dimension, involving appraisal of the meaning both of the experience and of what else might occur; and
- An affective-motivational dimension, including the emotional response, the motivation to avoid harm, and the expectations of whether such harm will be avoided.

8. **Contemporary Concepts**. Recent advances in brain imaging have given researchers powerful new methods of exploring brain mechanisms in pain. New concepts are emerging about the role of the cerebral cortex in the experience of pain. This research is driven by still unanswered questions about the nature of pain. One of these is phantom limb pain, pain that persists long after the limb and its relevant peripheral nociceptors have been removed.

As recently as 1999 Melzack, studying phantom pain, has proposed a neuromatrix theory of pain, which integrates the three dimensions of pain, various brain processes now understood, and the influences of the endocrine, immune, endogenous opioid, and autonomic

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nervous systems in the pain process.[11] This theory proposes a matrix of nerve cells in the brain that represents the whole body and creates our sense of "self".

9. Nielson, summarizing current concepts of pain in the Scientific Panel's report, makes these centrally important observations:

a) Simplistic concepts of pain as being either physical or psychological "have outlived their usefulness."

b) The concept of pain as a multidimensional experience, involving biological, psychological and social factors, is a paradigm shift accepted by most pain specialists. Under current theory psychological and social factors (e.g. the meaning of pain to the person, and its impact on family and work) are important *causative* factors in pain "and cannot be dismissed as reactions to pain." Therefore all biopsychosocial factors need to be addressed in successful pain management.

c) At the physiologic level, chronic pain states are now thought to be a result of complex changes in the whole pain regulatory system, rather than a specific malfunction of one or other of its component parts. It is this system dysregulation that explains persistent pain when the biomedical pathology has healed and gone. (This is so whether the chronic pain is from a phantom limb or from healed soft tissue after a back injury or a whiplash injury to the neck. The soft tissue may be healed, but the pain and disability are still caused by the injury and the dysregulation it is still causing the body's whole pain system).

d) A traditional purely biomedical approach to *acute* pain may be effective for some patients, because of the relevant predominance of physical factors. (This assumes that an effective treatment is used in the biomedical approach — a large assumption in the fields of neck and back pain.) Even with these patients, however, a biopsychosocial approach is more appropriate.

e) For patients with chronic pain a biomedical approach is simplistic and wrong, and will likely cause "anger, resentment, mistrust and confusion" on the part of the patient, aggravating the pain. (There is a deep irony and injustice here. The clinician, finding no evident physical cause, views the pain as psychogenic, exaggerated, and even evidence of malingering, and communicates this to the employer and insurer — and often, whether intentionally or not, to the patient. The chronic pain and disability, however, are frequently both real and aggravated or even caused by the clinician's incompetent management.)

f) Identifying and understanding the various biopsychosocial factors for each individual patient is important for all patients with pain, and for those with chronic pain "is the key to effective treatment."

C. Pathophysiology of Chronic Pain.

10. Scientific Panel member Robert Teasell, MD comments on the new scientific advances in neurobiology that link physical injury to chronic pain. Nociceptive messages arriving in the dorsal horn of the spinal cord can be amplified or prolonged by various known mechanisms including:

a) Activity of excitatory amino acids (e.g. glutamate and aspartate) and peptides (e.g. substance P — which can diffuse widely across nerve cells and has long-lasting excitability.)

b) The N-methyl-D-aspartate (NMDA) receptor, which can switch from a low to high level of pain related activity without any change in peripheral nerve input.

c) Other chemicals influencing the sensitivity of the sensory nerves, such as nerve growth factor which is transported along peripheral nerves to the spinal cord.

D. Relevance to Chiropractic Practice

11. The heartland of chiropractic practice has traditionally been chronic neuromusculoskeletal pain, predominantly back pain. Although patients receive best results when they consult a chiropractor immediately with acute pain, as is increasingly the case and as is recommended by the evidence-based national guidelines mentioned previously, traditionally patients have sought chiropractic care as a second or final choice. In the 1980s up to 85% of chiropractic patients had experienced pain for 6 months or more before receiving chiropractic care.[12] Today about half have chronic symptoms.[13, 14]

An earlier generation of chiropractors did not have the formal pain theory that exists today, but there can be little doubt that their distinctively chiropractic approach to patient management succeeded because it was securely based upon a patient-centered biopsychosocial model. Key elements of this include:

a) A philosophy of health which focuses on the inherent healing powers of the patient's own body and the whole person rather than symptoms, and which invites patients to become active partners in their own healing process.

b) A chiropractic office atmosphere that is positive and welcoming and service-oriented.

c) A more prolonged and thorough history and physical examination than is usual in other primary care practice, and, during examination, a hands-on process of palpation in which the patient's areas of dysfunction/subluxation and symptoms are independently discovered and/or verified, building patient trust and confidence.

d) A management approach combining the specific (e.g. biomechanical and neurological) and non-specific (e.g. placebo) benefits of spinal adjustment and other manual techniques; encouragement of continued activity rather than pain avoidance and rest; general health advice (e.g. on posture, diet, and other aspects of healthy living); and a course of treatment visits which allows the development of sufficient trust for patients to confide matters of psychosocial importance to them — and clinical significance in their management.

In an important review of the chiropractic profession for physicians just published in the February 2002 issue of the *Annals of Internal Medicine*,[15] many of these points are made eloquently by William Meeker, DC MPH and Scott Haldeman, DC MD PhD as follows:

> "The clinical encounter tends toward a high-touch, low-technology health model with more concern for the person than the disease. Chiropractors believe in the inherent healing ability of the body and communicate the hope of healing to patients. Spinal manipulation and other forms of touching care require that a level of trust develop between the patient and the chiropractor. Repeated visits allow a relationship to flourish that is often used to communicate on a social and psychological level as well as about biological implications of care.
>
> One recent essay opined that much of chiropractic's success and perhaps its most important contribution to health care might concern this patient-physician relationship. Analyses from anthropologic and sociologic

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reports that, because of the demands of their sports, many of the athletes he assisted have overuse/chronic injuries for which they receive regular chiropractic care to support them in training and competition.

Congratulations to our sports chiropractors and the athletes — especially new world record holder Derek Parra.

North America

US— Legislation and Litigation. *Federally Funded Chiropractic Benefits for Veterans*. This new legislation, passed by the US House of Representatives and Senate in December and discussed in the January 2002 issue of this Report, was signed into law by President Bush on January 23. *American Chiropractic Association (ACA) vs Department of Health and Human Services (HHS)*. The November 1999 issue of this Report discussed an important lawsuit being brought by the ACA against the US Department of Health and Human Services, alleging that the HHS was responsible for illegal restrictions on access to chiropractic services by Medicare patients enrolled with HMOs, in part by allowing chiropractic services to be delivered by medical doctors, doctors of osteopathy and physical therapists contrary to law. This was encouraged by a 1994 Policy Letter. The ACA filed its lawsuit in 1998 after negotiations to correct the situation had proved fruitless.

The first major victory of the ACA's lawsuit was gaining disclosure of information documenting that HMOs were using PTs and others extensively to deliver the chiropractic benefit of "manual manipulation of the spine to correct a subluxation." On January 15, 2002, as a second major achievement, HHS's Centers for Medicare and Medicaid Services (CMS) — formerly known as HCFA — issued a revised Policy Letter directing Medicare HMOs that they may not use PTs to deliver this service. The ACA will now monitor HMOs for compliance, and will continue its lawsuit with HHS with respect to unauthorized provision of chiropractic services by MDs and DOs.

Recent Research Highlights

1. **Cervical Adjustment Increases Active Ranges of Movement**. A new randomized controlled trial from Wayne Whittingham, DC PhD at RMIT University in Melbourne, Australia is of great interest since it reports "a consistent and statistically significant increase in active range of motion in the cervical spine after manipulation." The trial design is strong and, although previous uncontrolled studies have reached a similar conclusion, this is the first double-blinded RCT to document this objective, physiological effect of the adjustment. Details are:

a) 105 subjects with cervicogenic headache were randomly allocated to two groups, which were observed for three weeks then compared during three treatment stages of the trial as follows:

i) *First 3 weeks*. Group 1 received sham manipulation (deactivated Pettibon instrument), Group 2 received manipulation (single toggle recoil thrust) 3 times weekly.

ii) *Second 3 weeks*. Group 2 received no treatment, Group 1 received manipulation.

iii) *Third 3 weeks*. Group 2 received sham manipulation, Group 1 received no treatment.

All treatments were to the upper cervical spine, by the same chiropractor, and fixations/subluxations were identified by motion palpation or imaging.

b) At weeks 0, 3, 6, 9 and 12 active cervical range of motion (ROM) for all subjects was measured by two blinded examiners, using a goniometer as described.

c) After the first treatment period those in Group 2, the group receiving spinal manipulation, had significantly increased active ROMs compared with those in Group 1. After the second treatment phase, in which those in Group 1 received manipulation, the difference disappeared — now both groups had increased ROMs — in each of right rotation, left rotation, right lateral flexion and left lateral flexion.

d) Finally, in nearly all instances the increased active ROMs after manipulation still remained 3 and 6 weeks after the end of the manipulation phase. The only exception was right lateral flexion in 1 of the 2 groups.

(WhittinghamW, Nilsson N, (2001), *Active Range of Motion in the Cervical Spine Increases After Spinal Manipulation (Toggle Recoil)*, J Manip Physiol Ther, 24(9):552-555.)

2. **No Known Risk Factors or Screening Procedures for Rare Complications of Cervical Spine Manipulation**. A new review of 64 cases by Scott Haldeman et al. just published in *Spine* is of major clinical importance to chiropractors because of the quality of the data and its findings, which are:

a) There are no known risk factors for cerebrovascular accidents after cervical spine manipulation. Proposed risk factors have been age, gender, migraine headaches, hypertension, diabetes, birth control pills, cervical spondylosis and smoking, but they are not supported by the comprehensive data in this review.

b) The assumption that complications may be avoided by screening patients clinically through appropriate history and through positioning of the head and neck before manipulation to evaluate the patency of the vertebral arteries is not supported by the data either.

c) Suggestions that there may be an inherited arterial defect making certain individuals prone to injury "may hold the

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answer to these seemingly random cerebrovascular injuries". "Cerebrovascular accidents after manipulation appear to be unpredictable and should be considered an inherent, idiosyncratic and rare complication of this treatment approach."

Previous case reports, typically reporting one or a few cases, have many problems — no independent evaluation of the accuracy of the data, usually no contact with the manipulation practitioner, no attempt to evaluate the exposure of the patient to other suggested risk factors, and other reporting biases. This new study, the most thorough and reliable yet, involves 64 cases from throughout the US and Canada referred to Haldeman over 16 years as a consulting neurologist and potential expert witness in the context of malpractice claims and litigation.

Three independent reviewers had access to comprehensive medical and hospital records and the depositions of various relevant parties. It was found that the various suggested risk factors for cerebrovascular accidents were no higher amongst the 64 patients than amongst the US population in general. (Haldeman S, Kohlbeck FJ, McGregor M (2001) *Unpredictability of Cerebrovascular Ischemia Associated with Cervical Spine Manipulation Therapy: A Review of Sixty-Four Cases After Cervical Spine Manipulation*, Spine 27(1):49-55).

3. **The Science and Politics of Clinical Guidelines — The Need to Include Important Stakeholders for Validity.** *Spine* has recently published a review by Bart Koes, PhD, Maurits van Tulder, PhD et al. of the 11 sets of national guidelines for the management of low-back pain published between 1984 and 2000 — in Australia, Denmark, Finland, Germany, Israel, Netherlands, New Zealand, Sweden, Switzerland, the UK and the US. This review does not rate each of the guidelines for methodology and scientific merit — it merely compares their findings. Each set of guidelines purports to be evidence-based. However, although they are founded on the same scientific research, they come to different conclusions and points of key interest are:

a) All of the national guidelines based upon strong methodology and prepared by a multidisciplinary committee, including representatives of all major professional groups treating patients with low-back pain, recommended skilled spinal manipulation.

b) However a minority of four national guidelines, from Australia, Germany, Israel and Netherlands — all of which lacked any chiropractic/osteopathic/physical therapy input on the guidelines committees — did not recommend skilled spinal manipulation.

c) Koes et al. warn that "the makeup of the guideline committee may have a direct impact on the content of the recommendations." Asked by *Spine* to write a Point of View commenting on the review, epidemiologist Michel Rossignol, MD MSc, from McGill University, Montreal concludes that "the inclusion rather than the exclusion of important stakeholders can be seen as a necessary step in the development and implementation of guidelines." (Koes, BW, van Tulder MR et al. (2001) *Clinical Guidelines for the Management of Low-Back Pain in Primary Care: An International Comparison*, Spine 26(22):2504-2512.)

4. **Prevention for Back and Neck Pain Problems — What is the Evidence, What Works?** Very little, according to the evidence in a comprehensive new systematic review by Steven Linton, PhD from Sweden and Maurits van Tulder, PhD from the Netherlands, experienced epidemiologists in this field. The review included all standard medical approaches to prevent neck or back pain, whether primary prevention (provided to healthy people with the aim of preventing the onset of pain) or secondary prevention (attempts to prevent reoccurrence). Findings included:

a) "Taken together, the evidence to date suggests that traditional approaches to prevention such as back schools, lumbar supports and ergonomics have little empirical support. Only exercises muster some scientific evidence to support its use."

b) *Back schools*: "For back schools, only 1 of the 9 randomized trials reported a significant effect, and there was strong evidence that back schools are not effective in prevention."

c) *Lumbar supports*: "Because the randomized controls concerning the lumbar supports were consistently negative, there is strong evidence that they are not effective in prevention"

d) *Ergonomics:* There were no "properly controlled trials" for ergonomic interventions or risk factor modification, and thus "there was not good quality evidence available to draw a conclusion."

e) *Exercises:* Only exercises showed positive results "although most studies . . . were methodologically flawed and the effects (of exercises) are only weak."

Linton and van Tulder have two suggestions. The first is the use of multi-dimensional programs where a combination of methods is used tailored to individual need — this is increasingly common but there are no controlled trials of effectiveness. The second is that preventive programs should only be applied to those at particular risk for developing chronic problems — such selection may be more cost-effective. (Linton SJ, van Tulder MW (2001). *Preventive Interventions for Back and Neck Pain Problems: What is the Evidence?*, Spine, 26(7):778-787.)

Main Article References – *continued from page 8.*

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perspectives have suggested that treatment by a chiropractor, especially for many patients with chronic pain, can generate a sense of understanding and meaning, an experience of comfort, an expectation of change, and a feeling of empowerment. The hands-on and compassionate "can do" clinical behavior of the typical chiropractor seems to be concrete, reassuring, and immediately satisfying. Observational studies and randomized trials leave little doubt that chiropractic patients are very satisfied with their management."

E. Scientific Panel's Findings — Management

12. The Scientific Panel's literature review included all published research:

a) On work-related musculoskeletal pain persisting at least three months, "with or without clearly identified injury". Exclusions were chronic fatigue syndrome and conditions in which inflammation or other ongoing disease processes could be diagnosed (e.g. ankylosing spondylitis, lupus, rheumatoid arthritis, cancer, etc.).

b) Published in English before September 1998.

c) On three distinct areas of the problem — etiologic or prognostic factors for chronic pain (Group A); on interventions for prevention and treatment (Group B); and on disability management — which includes workplace initiatives (e.g. availability of modified work) and clinic-based initiatives (e.g. work-conditioning and work-hardening programs) (Group C).

The balance of this Report focuses mainly on Group B, with summary comment on Group C.

13. Unlike some reviews of the scientific evidence for and against the effectiveness of treatments, the Scientific Panel included prospective and retrospective studies in its review as well as randomized controlled trials (RCTs). However all of the evidence was subjected to a formal quality appraisal process in which one or more well-designed RCTs were required for findings of 'moderate evidence' (Level 2) or 'strong evidence' (Level 1) respectively with respect to any treatment or intervention. The five levels of evidence and their definitions, appear in Table 1.

14. Notably, on this rigorous scientific analysis no treatment intervention was found to have strong evidence of effectiveness for any chronic work-related musculoskeletal pain including:

- Spinal disorders (back, neck)
- Upper extremities (shoulder, arm, forearm, wrist, hand)
- Lower extremities (hip, knee, ankle, leg).
- Multi-locational pain disorders (fibromylalgia, somatoform pain, myofascial pain syndrome).
- Referred pain from a musculoskeletal injury.

15. Specific findings with respect to chronic back pain include:

a) **Manipulation and Mobilization**. There is moderate evidence (Level 2) that manipulation and mobilization are "more effective than placebos or usual care by the general practitioner, bed rest, analgesics, and massage in the short to intermediate term." (This chapter of the Scientific Panel Report, authored by its chiropractic expert Mior, gives much valuable detail and acknowledges that the recent systematic review by van Tulder et al. for the Cochrane Collaboration, which has a slightly different analysis of the quality of evidence, concludes that there is now "strong evidence that manipulation is more effective than placebo in the management of chronic low-back pain.")

b) **Exercise**. There is moderate evidence (Level 2) that exercise is effective for chronic low-back pain in the short to long term, and that advice to stay active would benefit workers with acute low-back pain. There is conflicting evidence (Level 4b) favoring any one exercise program over another. (Exercise seems to be the current fashion leader — in fact there is a similar level of evidence for each of manipulation and exercise. This strongly suggests that many patients should receive both, certainly until the sub-groups who benefit more from each are better identified.)

c) **Systemic Drug Treatment**. There is contradictory evidence (Level 4b) that NSAIDs are effective for chronic low-back pain, only limited evidence (Level 3) that muscle relaxants are of benefit, but moderate evidence (Level 2) that oral opioid analgesics provide benefit in the short to intermediate term.

Dwight Moulin, MD, the neurologist authoring this chapter of the Scientific Panel Report, also discusses tramadol, "a unique drug that has analgesic properties through activity as an anti-depressant and an opioid analgesic." Presently there is inadequate evidence (Level 4a) that either controlled-release or immediate-release tramadol is effective.

d) **Injections and Surgical Therapy**. There is limited evidence of effectiveness (Level 3) of intra-operative steroid at discectomy, though there is moderate evidence (Level 2) for standard discectomy for proven disc herniation. There is only limited evidence (Level 3) for caudal steroid injection for back pain and epidural steroid injection for sciatica with back pain. Chemonucleolysis , because of risk rates and the superiority of micro-surgical techniques "is now generally considered . . . unacceptable . . . and is no longer a current therapy."

e) **Acupuncture, TENS and Laser Therapy**. The evidence for all of these remains inadequate (Level 4a) or contradictory (Level 4b).

f) **Biopsychosocial Approaches**. There is moderate evidence (Level 2) that multimodal biopsychosocial treatments are effective for chronic low-back pain in the intermediate to long term. (These typically include a combination of exercise and psychologically-based techniques, the latter including cognitive-behavioral therapies including relaxation techniques and biofeedback). There is also moderate evidence (Level 2) for the

Table 1

Levels of Evidence

Level 1:	*Strong evidence* — multiple and relevant high-quality scientific studies.
Level 2:	*Moderate evidence* — one relevant high-quality scientific study or multiple adequate (i.e. study of medium quality with adequate measurement and analysis of the predictive factor under review) scientific studies.
Level 3:	*Limited evidence* — at least one relevant adequate scientific study.
Level 4a:	*Inadequate evidence* — only one relevant low-quality scientific study, the specific predictor under review in a medium-quality study was not adequately assessed, or no relevant adequate scientific studies were available.
Level 4b:	*Contradictory evidence* — contradictory results from scientific studies.

effectiveness of back school treatments. Unimodal biopsychosocial treatments, such as electromyogram, biofeedback and hypnosis, only have limited (Level 3) or inadequate (Level 4a) levels of effectiveness.

g) **Commentary**. Many chiropractors will have experienced the rejection of their care by workers' compensation insurers and others on the advice of medical experts asserting that chiropractic manipulation/management has no effectiveness for chronic back pain. Current scientific evidence says otherwise, and supports the following methods of evidence-based care:

i) For *acute* pain, manipulation and NSAIDs are the most effective treatments, to be combined with keeping patients active and motivated. Clinic-based exercise programs are not proven effective for patients with acute pain.

ii) For *chronic* pain, manipulation and exercise programs are proven effective, but NSAIDs are not. Multi-modal, biopsychosocial interventions are also effective — but expensive. Where used for selected patients they should include manipulation and/or exercise. For appropriate cases there is a role for surgery and specific drug treatments, but usual care by a family physician involving rest, analgesics and/or muscle relaxants, or referral for massage and/or physical therapy modalities, is not evidence-based or appropriate. The model of care must be biopsychosocial, not biomedical.

15. **Disability Management**. This term covers two different approaches to return to work — firstly modified work programs offered by the injured worker's employer, and secondly clinic-based programs known either as:

a) Work-conditioning programs — "programs emphasizing physical conditioning and functional activities related to work, and provided in a single discipline model."

b) Work-hardening programs — "multidisciplinary programs that address physical and functional needs and use graded work simulations and psychosocial intervention." (The Scientific Panel takes these two definitions from 1993 guidelines of the American Physical Therapy Association).

With respect to modified work programs, there is moderate evidence (Level 2) that these improve the return to work (RTW) rate of workers with work-related injuries. Teasell and Bombardier, authoring the Scientific Panel's chapter on Employment-Related Factors, report substantial reductions in disability where appropriately modified work is offered on an individual basis in a comprehensive disability package offered by the employer — also involving non-adversarial handling of workers' compensation claims.

With respect to work-hardening and work-conditioning programs, however, the 12 studies published to date are contradictory (Level 4b) and provide no clear evidence for or against the effectiveness of these programs.

F. Conclusion

16. Although the Scientific Panel's Report has only now been published in the peer-reviewed literature, increasing its availability and authority, it was completed and delivered to the Ontario WSIB in 2000. This scientific report was then reviewed by a WSIB Policy Advisory Panel with 12 members representing all stakeholders — including employers, unions, injured workers, health professionals and the WSIB itself.

The Policy Panel gave recommendations to the WSIB in late 2000 in a final report titled *Chronic Pain Initiative: Report of the Chair, Chronic Pain Panels*. Please note that this report, with much important detail on management protocols, may be viewed and downloaded from http://www.wsib.ca/wsib/wsibsite.nsf/Public/ChronicPainReport.

The fundamental recommendation of the final report was that:

"The Workplace Safety and Insurance Act and the WSIB should

The Art of Chiropractic

Preparing Patients For Unexpected Consequences

In this continuing feature clinical pearls on the art of patient management are given. These are from experienced practitioners. This month, thank you to Dr. Sira Borges of Salvador, Brazil.

As you will know, patients react differently to their first adjustments. Some experience instant benefits. Others, may have temporary new areas of pain and discomfort or unexpected tiredness. These things worry patients but they may not discuss them with you and this will influence the effectiveness of your care and their level of satisfaction. There are two ways of preparing patients for this situation, and both should be used.

Firstly prepare the patient in writing. This should be part of the instructions and orientation information that the patient receives at your office, reads before treatment, and takes home. There should be one or two paragraphs drawing attention to various unexpected outcomes as normal reactions to treatment. Your advice might read, for example:

> **How will I react to my first treatment?** After your first chiropractic treatment you may experience a number of reactions that are unexpected and surprise you. These may include temporary pain in different areas of your body, general aching or sleepiness, feelings of increased alertness or euphoria, or improvement in other functions such as easier breathing or better digestion.
>
> Why is this? These are simply your body's early responses to the effects of chiropractic treatment. Chiropractic joint adjustment in one area of the spine may influence the function of your body in other areas in two ways. Firstly it can change the functional or movement patterns of joints throughout your spine. For example, improving the function of joints in your low-back may affect the function of joints in your pelvis or mid-back or neck causing temporary discomfort as your spine adapts. Secondly, spinal adjustment or manipulation sends a stream of nerve impulses into your central nervous system which controls all your body functions. This may result in a variety of short and long-term beneficial effects.
>
> Don't worry about any early unexpected reactions to your first chiropractic treatments. These will generally be quite normal. Please discuss them with Dr. X, who will be pleased to give you a fuller explanation if you wish.

Secondly, your history and examination will identify patients who, depending upon their various characteristics and their spinal regions being adjusted, are more likely to react in ways that will surprise them. They should be given verbal reinforcement — draw attention to the notice, make sure they have read it, give a brief explanation appropriate to their case and explain you will look forward to their comment on the next visit.

In my experience a greater number of patients discuss all reactions to treatment with you when you have prepared them in this way. I then check whether they read about unexpected reactions in my orientation information — almost always the answer is yes.

treat and underwrite chronic pain as they would any other workplace injury or illness."

Finally it is important to give the summary background to this whole exercise and the other major recommendations, as all of this will be relevant to chiropractic practice in many jurisdictions. Briefly:

a) Before 1987 the Ontario WSIB did not allow compensation for disability from chronic pain because of skepticism about its medical legitimacy, and interpretation of the law to say that it was not caused by the work injury now "healed".

b) In that year an appeal case held that chronic pain was compensable since it was substantially caused by the work injury. That has been the policy under the law in Ontario ever since.

c) However in 1996, because of the huge cost of chronic back pain and disability, and resulting pressure from employers, the Ontario government proposed a reform limiting compensation for chronic pain, interestingly defined in this context from a narrow biomedical perspective as "pain that persists beyond the usual healing time for an injury and is a complex phenomenon without any direct evident physical cause." The tactic was to sever the causative link between a workplace injury and chronic pain.

d) This proposal drew an outcry from workers and the health care community led by Robert Teasell MD FRCPC, a prominent specialist in physical medicine and rehabilitation, whose paper titled *The Denial of Chronic Pain* cited new scientific studies demonstrating that chronic pain was often an organic result of injury rather than just a psychological phenomenon.

e) In the face of this the Ontario government held back its legislative reform and in early 1998 the WSIB announced the creation of Scientific and Policy Advisory Panels "to assemble and analyze scientific evidence on the causation, prevention, treatment and management of chronic pain; and recommend evidence-based policies and strategies related to the prevention, compensation and management of chronic pain disability" for the Ontario workers' compensation system.

f) Recommendations of the Policy Panel, made after the report of the Scientific Panel, were that chronic pain should continue to be compensable and that:

- An internal group at the WSIB should implement the Policy Panel's consensus recommendations for more effective treatment, management and return to work strategies.
- The WSIB should conduct a review in five years to assess the effectiveness of the strategies implemented and new scientific evidence about the work-relatedness of chronic pain.

g) The WSIB has subsequently begun to implement these recommendations, starting with chronic low-back pain because of its prevalence and cost. With respect to treatment, a multidisciplinary internal working group has developed evidence-based treatment protocols which focus on the services to be provided rather than who should provide them. A prominent role is given to skilled manipulation and the use of exercises during the first 6 months after injury, with nurse case managers considering referral of injured workers to a multidisciplinary team for assessment and treatment at 4-6 weeks, especially if the worker has not returned to work, to ensure appropriate care to prevent and/or manage chronic pain from that point in time.

In Ontario injured workers are entitled to choose chiropractic services, which have long been integrated into and funded by the WSIB's workers compensation scheme. What is new for workers and exciting for the chiropractic profession — and the result of the most thorough and comprehensive study yet of chronic work-related pain — is that where workers do not choose chiropractic care there are now evidence-based protocols encouraging nurse case managers to refer them for chiropractic management at the sub-acute and chronic stages of their pain and disability. TCR

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