The Chiropractic Report

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Professional Notes

Spinal Pain at 100

Are back and neck pain preventable and curable or mostly part of human life?

Much effort and cost have been focused on eliminating suspected work-related causes and primary prevention – but how far will that get us if back and neck pain are just as common in nonworking populations throughout life?

These are questions asked by Jan Hartvigsen, DC, PhD, and Kaare Christensen, MD, PhD from the University of Southern Denmark as they report a survey of Danish 100-year-olds which shows that neck and back pain are just as common at that age as at other ages including working age adults – and are associated with similar factors.

It is possible now to survey 100-year-olds because there has been a large increase in their number – in Europe a 15-fold increase in 30 years in some countries, with numbers now doubling every 10 years. Key points from the new study are:

a) Trained interviewers from the Danish National Institute of Social Research

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Supermarket or Science for Chronic Back Pain

A. Introduction

THE JANUARY/FEBRUARY SPECIAL focus issue of *The Spine Journal*, the official journal of the North American Spine Society (NASS), contains a comprehensive review of chronic low-back pain (CLBP) and the evidence for and against the many methods of management of patients with this condition – the single most expensive cause of pain and disability in working age adults.[1]

Do we need another review? Why is a further analysis of the research important – as opposed to new controlled trial evidence? From a chiropractic perspective one could argue:

a) There is no debate that CLBP is hugely significant, expensive, disabling and that patients must be treated on a biopsychosocial basis.

b) There are many influential clinical guidelines that support the chiropractic approach to management – specifically patient motivation/education, chiropractic manipulation and exercise. These guidelines include:

1 **Workplace.** Specific evidence-based guidelines for workers with CLBP, such as those developed by the Ontario Workers' Safety and Insurance Board in Canada. (Available at www.wsib.ca. See The Chronic Pain Report, and guidelines for each of acute and chronic pain).[2]

2 **North America.** Last year's Guideline on Back Pain from the American College of Physicians.[3] Most guideline panels are interdisciplinary. Here a panel of medical experts only produced guidelines recommending spinal manipulation for both acute and chronic back pain patients. (Available online without charge at www.annals.org).

3 **Europe.** The European Back Pain Guidelines.[4] In the absence of red flags these also recommend spinal manipulation and exercise for patients with CLBP. (Available online without charge at www.backpaineurope.org).

c) With respect to cost-effectiveness, the recent large multicenter back pain, exercise and manipulation trial (BEAM trial) in the UK sponsored by the British Medical Research Council has shown "convincingly that both manipulation alone and manipulation followed by exercise provide cost-effective additions to best care (for low-back pain patients) in general practice."[5]

2. Well, yes, all of that's true. However this new review is different and important. It raises some frank and challenging questions for all health professionals managing patients with CLBP, especially with respect to invasive care, surgical devices and various classes of medications. Clinicians should be aware of the new report because:

a) There are separate papers by experts reviewing each common treatment approach from acupuncture to surgery. See Table 1 for a list of the treatment approaches reviewed. Authors of the reviews of spinal manipulation/mobilization and of manipulation under anesthesia are doctors of chiropractic.

b) These reviews are more practical and informative than usual. This is because they include not only evidence of efficacy and safety but also a brief history and description of the treatment approach, comment on the practitioners involved, comment on reimbursement available in North America, description of mechanisms of action of treatment, and review of indications and counter-indications.

c) There is online access to these reviews without cost – www.sciencedirect.com/science/journal/15299430 and click on Vol. 8 Issue 1. This is your opportunity to read a thorough description and review of all of the treatments for CLBP.

Main Article *continued from page 1*

Table 1: Treatment Approaches Reviewed

Adjunctive analgesics
Back schools, brief education and fear-avoidance training
Cognitive behavioural therapy
Epidural steroid injections
Facet injections and radiofrequency neurotomy
Functional restoration
Herbal, vitamin, mineral and homeopathic supplements
Intradiscal electrothermal therapy
Lumbar extensor strengthening exercises
Lumbar stabilization exercises
Massage
McKenzie Method
Medicine-assisted manipulation
Minimally invasive nuclear decompression
Needle acupuncture
Nonsteroidal anti-inflammatory drugs, muscle relaxants, and simple analgesics
Opioid analgesics
Physical activity, smoking cessation and weight loss
Spinal manipulation and mobilization
Transcutaneous electrical nerve stimulation, interferential current, electrical muscle stimulation, ultrasound and thermotherapy
Traction therapy
Trigger point injections
Watchful waiting

d) Project leaders for this new review are Scott Haldeman, DC MD PhD, Department of Neurology, University of California, Irvine, a Past-President of the North American Spine Society and widely acknowledged as an international leader in this field, and Simon Dagenais, DC PhD, Department of Epidemiology and Community Medicine, Faculty of Medicine, University of Ottawa, Canada.

e) In their editorial and introduction they are frankly critical of what they describe as a supermarket approach to the management of patients with CLBP. Many health care professionals, pharmaceutical companies and surgical device manufacturers offer numerous untested treatments. No treatment has clear superiority. Even those treatments with most evidence, such as manipulation, have major unanswered questions. For the present we must downgrade talk from 'evidence-based care' to 'evidence-informed care'.

3. Accordingly this issue of The Chiropractic Report looks at this comprehensive new assessment of CLBP which, because of its recognized importance, is generously and unusually offered free by *The Spine Journal* to all. There is then an overview of current chronic pain theory, how chiropractic management is consistent with that theory, and finally comment on the practical matter of frequency and duration of care.

Correction. In the March issue (Vol 22 No 2) the figure of 190 million in para 18 should be 109 million, representing 7.5 cases per million years. We regret the error.

B. Spine Journal Report

4. **Supermarket vs Science.** A goal of Haldeman and Dagenais when they selected authors and embarked on this project was to come up with clear recommendations regarding the use of specific interventions for CLBP. Such recommendations were needed given the plethora of over 200 different treatments being offered in North America and the fact that new CLBP treatment options were occurring every year with strong and commercial advocates and generally limited scientific evidence.

Haldeman and Dagenais explain that when a new treatment approach is considered in fields such as cardiology, infectious diseases or neurology, the expectation is that adequate research will support its effectiveness, safety and cost-effectiveness before it is endorsed. But with respect to CLBP:

"Decades spent listening to presentations at scientific meetings, reading textbooks, discussing the problem with clinicians and patients, listening to advertisements on the television or radio, and browsing the internet, could lead one to conclude that the classical method of making healthcare decisions based on scientific evidence and expert consensus appears to have been replaced with a commercial and competitive model akin to shopping at a supermarket.

This analogy is reinforced by visiting the commercial displays at spine meetings, where there is intense competition by pharmaceutical companies, surgical instrument makers, and device manufacturers to convince stakeholders of the benefits of their products. Only rarely do such promotional materials accurately present the scientific evidence underpinning a particular approach, and rarer still are there discussions of potential harms. Similar concerns about the commercialization of treatments for CLBP have been expressed elsewhere".

They expand this metaphor by suggesting the following treatment options available to patients:

- Storefront window shopping – self-care, reassurance, activity modification.
- Aisle 1 – pharmacological – over 60 alternatives.
- Aisle 2 – manual
- Aisle 3 – exercise
- Aisle 4 – physical modalities

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• Aisle 5 - educational and psychological

• Aisle 6 – injection

• Aisle 7 – minimally invasive

• Aisle 8 – surgery

• Aisle 9 – lifestyle therapies

• Aisle 10 – CAM – including acupuncture, nutritional and herbal supplements and homeopathic medications.

Haldeman and Dagenais's overall position as they commenced their project was that it was currently impossible for patients, clinicians, third party payors and other stakeholders to know what was the best management approach and what was likely to result in clinically meaningful improvement for individual patients. This new research project, updating reviews to include recent research, was designed to help. Did it?

5. **Editorial Conclusions**. Haldeman and Dagenais summarize all the individual papers in their editorial which they title *What we have Learned about the Evidence-Informed Management of Chronic Low Back Pain*. Key points they make are:

a) For a solid evidence-based medicine (EBM) approach to CLBP, there should be "multiple, high-quality randomized controlled trials (RCTs) ". Because there is not such evidence, and because frankly "funding and conducting multiple high-quality RCTs for each of the 200 or more individual treatment options currently available for CLBP is simply beyond the realm of possibility", authors for the current exercise were asked to write about "evidence-informed" care rather than "evidence-based" care.

b) All of the research reviews reflect well-known problems. Those written by expert clinicians tend to be overly optimistic about the benefits of procedures they are offering, research articles by researchers - many of whom are clinical epidemiologists - tend to be overly pessimistic. "Although the former often discount research evidence, the latter overlook clinical experience: neither viewpoint is ideal."

c) The best available evidence today "is not materially different than the recommendations from the *Practice Guidelines on Acute Low-Back Pain in Adults* published in the US by the Agency for Health Care Policy and Research (AHCPR)[6] in 1994. The evidence reviews now published "do suggest that a reasonable approach to CLBP would include education strategies, exercise, simple analgesics, a brief course of manual therapy in the form of spinal manipulation, mobilization or massage, and possibly acupuncture." These should be preferred to more complex or invasive approaches.

d) "In patients with long-standing or severe symptoms and psychological co-morbidities, there is some evidence that a comprehensive multidisciplinary approach with cognitive behaviour treatment, fear avoidance training or functional restoration, is at least as beneficial as surgery."

e) **"**In this supermarket of over 200 available treatment options for CLBP we are still in the era of caveat emptor (buyer beware)," and "no single approach has been able to demonstrate its definitive superiority."

f) With respect to diagnostic testing, enormous resources are devoted to testing that is seldom required before considering particular interventions. "There is clearly no consensus" say Haldeman and Dagenais, "that commonly used diagnostic tests hold any value in the decision-making process before offering a treatment for CLBP" and this "brings into question the routine use of laboratory testing, x-rays, CT, MRI, discography, nerve conduction velocity, and electromyography by clinicians evaluating CLBP".

6. **Spinal Manipulation and Mobilization**. The single most important paper for the chiropractic profession is *Evidence-Informed Management of Chronic Low-Back Pain with Spinal Manipulation and Mobilization.*[7] Authors, all prominent chiropractic scientists are Gert Bronfort, DC PhD (Northwestern Health Sciences University), Mitch Haas, DC MA (Western States Chiropractic College), Roni Evans, DC MS (Northwestern), Greg Kawchuk, DC PhD (Faculty of Rehabilitation Medicine, University of Alberta) and Simon Dagenais, DC PhD (Department of Epidemiology and Community Medicine, Faculty of Medicine, University of Ottawa).

As explained, this paper is available for downloading and use by you. For reasons described below it provides the best current review of spinal manipulation (called spinal manipulative therapy or SMT in this paper) and spinal mobilization (MOB). Some clinicians, with the bias of enthusiasm for their treatment approach mentioned by Haldeman and Dagenais, will find the conclusions of Bronfort, Haas et al. cautious – as they in turn display the conservative bias of researchers. However, the findings for the efficacy and safety of SMT and MOB are overall positive, and the objective and more conservative tone makes these findings and the paper more convincing to other stakeholders than more aggressive claims. Other reasons why this paper is of particular value and support for doctors of chiropractic in their practices are that:

• It has a summary review of topics of interest to referring medical doctors and others who may know little about spinal manipulation – including the long history of use of manipulation, description of typical elements of examination and treatment in practice today, the role of the chiropractic profession, mechanisms of action (mechanical, neurological, other), and indications and contraindications for use. Overall, medical doctors will find this an excellent authority for referral of acute and chronic LBP patients with confidence.

• It provides an updated list of references for all randomized controlled trials relative to SMT/MOB for patients with CLBP or mixed acute/chronic LBP.

7. Significant points and conclusions from the Bronfort, Haas et al. paper include:

a) There are now more randomized controlled trials examining SMT for low-back pain than any other intervention.

b) The overall evidence relative to efficacy and safety, "including recent high-quality trials", "supports SMT and MOB as viable options for the treatment of CLBP . . . SMT and MOB are at least as effective as other efficacious and commonly used interventions."

c) One needs to read the paper for many specific findings. However, for example from the trials where all patients had CLBP there is good evidence ('moderate' rather than 'weak' or 'strong') that:

• "SMT/MOB is superior to usual medical care for patient improvement"

• For pain reduction "SMT with strengthening exercise is similar to prescription NSAIDs with exercise in both the short-term and long-term."

• "High-dose (*i.e. more frequent)* SMT

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Spinal Pain at 100

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interviewed in person 256 centenarians born in 1905, asking questions about back and neck pain in the past month, physical functioning, and past and current diseases, with positive answers being confirmed with physicians. The presence of depression was assessed using a questionnaire with 32 depression-related items.

b) 27% had experienced back pain in the past month, 22% neck pain. This compared with 25% for back pain and 21% for neck pain in a similar study involving 4,412 Danish twins aged 70–90.

c) Approximately 20% were bothered by back pain when moving or resting or sleeping.

d) Over half rated their health as excellent to good on a 5 point scale (excellent, very good, good, fair, poor). Factors associated with back or neck pain were:

- Poor overall physical functioning
- Higher depression score – there was a particularly strong coalition here
- Rating one's health as less than very good
- A current or previous diagnosis of osteoarthritis, migraine headaches, disc prolapse or osteoporosis

Hartvigsen and Christensen conclude that the prevalence of bothersome back and neck pain "is practically identical to the prevalence in younger groups of seniors and similar to other ages from late childhood and youth over adulthood into retirement."

Further, characteristics seems to be similar between the ages – back and neck pain were associated with poorer physical function, a number of co-morbidities including depression, and poorer self-rated health.

They are tempted to speculate that back and neck pain have a stable prevalence across all age group unrelated to age and that "primary prevention may be an illusion since the pain is going to appear anyway." Consequently there should be a focus on secondary prevention – i.e. safe and effective treatment - "to avoid irrational pain behavior and chronicity which is associated with over 80% of societal cost from back and neck pain."

(Hartvigsen J,Christensen K (2008) *Pain in the Back and Neck Are With Us Until the End. A Nationwide Interview-Based Survey of Danish 100-Year-Olds.* Spine 33, 8: 909-913)

WHO Congress on Traditional Medicine

In celebration of its 60th anniversary year the World Health Organization (WHO) is holding its first Congress on Traditional Medicine at the Hotel Jiuhua Spa and Resort in Beijing from November 7-9. An important part of the Congress will be symposia on what WHO identifies as three main areas of traditional medicine TM or complementary and alternative medicine (CAM) – herbal remedies, acupuncture and manual health care.

WHO has asked the World Federation of Chiropractic (WFC) to organize the Symposium on Manual Methods of Health Care, and many doctors of chiropractic will be attending this historic meeting. What is the background and why should you consider being there?

Under its TM/CAM 2002-2005 Strategy, WHO began an active policy of promoting the acceptance and use of CAM within national health care systems – specifically including chiropractic. Part of this policy has been the development of guidelines for appropriate education and licensure of practitioners. The 2005 WHO Guidelines on Basic Training and Safety in Chiropractic, now available in 12 languages, were developed for this reason. (They can be downloaded at www.wfc.org under Newsroom and Highlights.) There are similar guidelines for acupuncture and the use of herbal medicines, and other guidelines are being developed for osteopathy and tuina.

Since 2002 WHO has been actively encouraging governments to promote TM/CAM by various methods, including seeking annual reports on how many countries have developed a policy on promotion of TM/CAM and have moved to legislation and regulation. It is against this background that WHO is now holding its Congress in China, the best example worldwide of a country which has full integration of modern and traditional medicine. Objectives for the WHO Beijing Congress on Traditional Medicine include:

WHO Congress on Traditional Medicine

7-9 November 2008, Beijing, China

Co-Sponsored and hosted by the
Ministry of Health of China and
State Administration of Traditional Chinese Medicine

Symposium on Manual Methods of Health Care

Organized by the
World Federation of Chiropractic

Featuring:

- Opening Ceremony, People's Great Hall, Forbidden City, Friday morning November 7
- Symposium on Manual Methods of Health Care, November 7-8
- Symposium on Acupuncture and Symposium on Herbal Medicines, November 7-8
- International Forum on Integration of TM/CAM into National Health Systems, November 7-8
- Visits to TCM hospitals – November 9

For all information visit:

www.wfc.org/WHOBeijingSymposium

• A review of countries' progress in the integration of TM/CAM in their health care systems.

• To share information and experience on how to integrate TM/CAM.

• To share information related to research, education and practice in TM/CAM.

• To produce a WHO Declaration on the Promotion of TM/CAM in National Healthcare Systems

Those attending the Congress will be government delegates from WHO member countries throughout the world and many health professionals. Component parts of the Congress are:

1. **Opening ceremonies.** These will be held in the morning of Friday November 7 at the People's Great Hall in the Forbidden City, Beijing, hosted by the Chinese government which is co-sponsor of the Congress.

2. **Forum for Government representatives, November 7-8.** This will hear country reports on the integration of TM/CAM disciplines into health care systems and pass a WHO declaration on the promotion of TM/CAM. It is open to delegates of governments and non-governmental organizations or NGOs in official relations with WHO including the World Federation of Chiropractic (WFC).

3. **Technical Symposia November 7-8.** These, organized by NGOs in official relations, are:

• Symposium on Manual Methods of Health Care (World Federation of Chiropractic)

• Symposium on Acupuncture (World Federation of Acupuncture Moxibustion Societies)

• Symposium on Herbal and Traditional Medicines (World Self Medication Industry)

4) Symposium on Self-Care (World Self Medication Industry).

The Symposium on Manual Methods of Health Care will feature:

• 30 minute presentations from representatives of many manual disciplines giving an overview and then a short demonstration of technique – e.g. bonesetting, chiropractic, Naprapathy, osteopathy, Chinese tuina, Korean Chuna, judo bonesetting, nuad Thai, etc.

• Overviews of the research status of Western and Asian manual health care respectively from Dr. Scott Haldeman, Chair, WFC Research Council and Professor Yan Juntao, President, Association of Tuina in China.

• A visit to a traditional Chinese medicine hospital to witness the practice of tuina – Sunday November 9.

For more complete details of the program and all information on the meeting go to www.wfc.org/WHOBeijingSymposium.

WFC/ACC Education Conference on Technology. Partly to ensure a strong chiropractic presence at the WHO Congress, immediately afterwards the WFC and the Association of Chiropractic Colleges hold their biannual education conference at the same venue, the Hotel Jiuhua Spa and Resort in Beijing. This meeting is about the use of modern technologies in education and continuing education and is titled *Chiropractic Education in an Era of Digital Natives and Digital Immigrants: How To Make The Successful Transition To 21st Century Technology.*

For all information on this meeting go to www.wfc.org under Events. One registration fee for either the WHO Congress or the WFC/ACC Education Conference entitles the registrant to go to both meetings.

There are now over 100 doctors of chiropractic in China – principally in Beijing, Chengdu, Hong Kong, Macao and Shanghai – and they are forming a national chiropractors association of China in preparation for the meetings in November. For more information on this contact Lorraine Rhoden at the WFC at lrhoden@wfc.org.

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is superior to low-dose SMT" for pain reduction in the short-term.

• Flexion/distraction MOB is superior to a combined exercise program for pain in the short-term and superior/similar in the long-term."

d) From the nine RCTs where most patients had CLBP but some had acute LBP, there is good evidence ('moderate to strong') that:

• SMT is similar in effect to a combination of medical care with exercise or exercise instruction.

• SMT is superior to usual medical care alone

• SMT/MOB is superior to physical therapy and to home exercise in the long-term

It is important to emphasize that all these findings are for patients with chronic pain. Historically many medical advisors to employers and workers' compensation authorities have acknowledged that spinal manipulation may be of value for patients with acute pain, but argued that it is of little value and inappropriate for patients with chronic pain – who need exercise and work hardening and multidisciplinary programs. Today the evidence is that SMT/MOB is as effective or superior to these and other commonly used medical approaches.

• Bronfort, Haas et al. note that there are two recent high-quality systematic reviews of the evidence supporting SMT/MOB for patients with CLBP, both of which are positive – reviews by Assendelft, Morton et al. for the Cochrane Collaboration (2004)[8] and van Tulder, Koes et al. (2006)[9]. One other recent evidence review by Ernst and Canter is less positive but is criticized and discounted because of several quality problems. [10]

e) With respect to harm it is noted that the only likely side effects of SMT/MOB are minor, temporary and typically do not interfere with activities of daily living. In essence there are no safety concerns. This represents a major advantage for SMT/MOB over drug and surgical treatments.

f) A problem many clinicians rightly have with systematic reviews of the evidence, even those with good methodology, is that they lump together trials involving different health professionals with different levels of education and skill, using both SMT and MOB, and with patient groups that are not directly comparable. It is worth noting that Bronfort, Haas et al. acknowledge this problem to some degree by noting "SMT/MOB therapeutic approaches are applied by providers with different backgrounds and training, which may affect outcomes."

8. **Medicine-assisted Manipulation**. Principal authors are Simon Dagenais, PhD, John Mayer, DC PhD and James Wooley, DC all affiliated with the CAM Research Institute, Irvine, California, and medicine-assisted manipulation (MAM) is defined as "manipulation of the spine after any type of anesthesia or analgesia whether facilitated by injections or oral pharmaceuticals". [11] The most common form of MAM is manipulation under anesthesia (MUA). Other forms are manipulation under epidural steroid injection and under joint anesthesia.

The historical review notes that first studies were published in the 1940s and 1950s when MUA was practised by orthopedic surgeons and doctors of osteopathy, and describes considerable growth in the practice which is now typically performed by doctors of chiropractic in the US, working in hospital-based multidisciplinary teams. There is a detailed description of how procedures are performed. Points of interest include:

a) The general indication for use of MUA is non-specific mechanical CLBP that has failed to respond to conservative care, including 4-8 weeks of SMT. Proponents claim that up to 10% of chiropractic patients would be candidates – those with hypomobility, failed back surgery, nerve entrapment, chronic fibrositis, chronic muscle contracture and a degree of pain that makes them fearful of SMT. There are no controlled studies to confirm this.

b) The use of MUA has grown from clinical observation that the combined effects of anesthesia/analgesia and SMT are more beneficial when they are administered together. The relaxation brought about by MUA is postulated to allow SMT to more effectively break up joint and soft tissue adhesions with less force than would otherwise be required to overcome patient resistance or apprehension. SMT during MUA disrupts adhesions in collagen fibers with less risk of acute inflammation and scar tissue formation. Again, these are unproven theories.

c) At present there is little evidence supporting or refuting the value of MAM – not one quality RCT and only a few published case series. The authors conclude that there is insufficient research for any firm conclusions. MAM is based on the mostly positive experience of clinicians, a few observational studies, presumed satisfied patients, and "these procedures deserve the same consideration that is given to other treatment approaches with weak levels of evidence."

9. **Cost of Low-Back Pain.** This review is by Dagenais, Caro and Haldeman[12] and looks at the evidence in the US and internationally coming to the standard conclusion – actual cost is unclear because of the many different ways of measuring it, but is certainly vast, with indirect costs from disability from chronic LBP causing the majority of cost. Some recent figures of interest are:

a) A 2001 study in Australia by Walker, Muller et al.[13] puts the annual cost of back pain at $9.1 billion, being $1 billion in direct costs and $8.1 billion in indirect costs. This amounts to $474 per person in the total Australian population.

b) A 1998 US study assesses annual direct costs of LBP (i.e. not total costs – not including indirect and disability costs) at $90.6 billion. [14]

c) A US study of costs associated with common pain conditions in the workforce published in 2003, [15] reports that indirect/disability costs for back pain (estimated $19.8 billion) were higher than such costs for any other condition – higher than headache ($19.6 billion), arthritis ($10.3 billion) and all other pain conditions ($11.6 billion) considered in the survey.

10. **Conclusion.** In their editorial Haldeman and Dagenais offer the papers in this special focus issue of *The Spine Journal* as the best starting point for all stakeholders – patients, clinicians, third party payors and policy-makers – wanting "quality information to make decisions about the evidence-informed management of CLBP."

They also encourage all clinicians to use the opportunity offered by these complimentary online expert reviews to "help overcome our natural tendencies to support only those treatments with which we are most familiar and dismiss those about which we know little." So if you have waited for the opportunity to understand the theories and evidence for vari-

ous specific treatments listed in Table 1 – and want to know as much about them as other spine care professionals and your best informed patients – start downloading and reading now.

C. Concepts of Chronic Pain

11. From the mid-1960s Melzack and Wall's gate control theory of pain[16] revolutionized understanding and research in pain theory. This described a controlling or gating mechanism in the spinal cord which modulated the competing information from small diameter peripheral nerve fibers (conducting pain-producing impulses) and large diameter ones (inhibiting the impulses) and then governed by 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 Melzack and Wall's gate control theory, pain has three distinct dimensions:

1 A sensory-discriminative dimension, involving the location, quality, and intensity of the painful sensation;

2 A cognitive-evaluative dimension, involving appraisal of the meaning both of the experience and of what else might occur; and

2 An affective-motivational dimension, including the emotional response, the motivation to avoid harm, and the expectations of whether such harm will be avoided.

12. Recent advances in brain imaging have given researchers powerful new methods of exploring brain mechanisms in pain, and 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 nervous systems in the pain process.[17] This theory proposes a matrix of nerve cells in the brain that represents the whole body and creates our sense of self.

13. Nielson,[18] summarizing current concepts of pain in a comprehensive scientific report for one of the largest workers' compensation agencies in North America, observes:

a) Simplistic concepts of pain as being either physical or psychological are historical.

b) Pain is a multidimensional experience, involving biological, psychological and social factors. 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 Aand 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 *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 continued dysregulation it is 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) 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.

14. Teasell,[19] writing on the same scientific panel as Nielson, describes new advances in the understanding of the pathophysiology of chronic pain. It is now appreciated that nociceptive messages arriving in the dorsal horn of the spinal cord can be amplified or prolonged by various 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. Chiropractic Practice and Chronic Pain

15. 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, 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.[20] Today about half have chronic symptoms.[21,22]

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 then 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 C and clinical significance in their management.

As Meeker and Haldeman say, doctors of chiropractic "communicate the hope of healing to patients" and "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."[23]

16. **Frequency and Duration of Care.** Haldeman and Dagenais recommend a first line management approach of patient education, exercise, simple analgesics and/or "a brief course" of SMT/MOB or massage. What is regarded as "a brief course" of SMT/MOB with chronic pain patients? The advice of a RAND Corporation interdisciplinary expert panel, subsequently adopted in chiropractic national guidelines in the US and Canada, is that "an adequate trial of spinal manipulation is a course of two weeks for each of two different types of spinal manipulation (four weeks total) after which, in the absence of documented improvement, spinal manipulation is no longer indicated."[24,25]

Typically a patient is given SMT/MOB three times weekly in initial weeks. Today "documented improvement" is generally established by patient-reported questionnaires on pain and disability. Where there is documented improvement within four weeks but significant continued pain and disability, guidelines typically recommend a total of eight weeks for acute and uncomplicated pain, a total of up to 16 weeks for chronic pain.

11. In the US most insurance companies now send their chiropractic and medical consultants to the Official Disability Guidelines (ODG) produced by the Work Loss Data Institute for recommendations on duration and frequency of care. See ODG Treatment, available online at www.disabilitydurations.com upon subscription. Currently under ODG Treatment the recommendation for SMT/MOB for all low-back pain patients – acute, subacute or chronic – is up to 18 visits over 6 to 8 weeks "on the basis of objective improvement during the first six visits."

However the issue of an appropriate course of care is complicated by many factors in individual cases, including the common experience of new musculoskeletal mechanical problems and re-injury from daily ongoing activities of life. Kirkaldy-Willis and Cassidy produced their excellent results with CLBP patients fully disabled by mechanical back pain for an average of over 7 years, with 2 to 3 weeks of daily treatments, then additional manipulative care as needed over the next 12 months.[26] This resolved the pain and disability for most of these truly chronically disabled patients.

What is clear from the research, especially following this new special focus issue of *The Spine Journal*, is that chiropractic management as discussed represents a safe and effective first line approach to treatment for most CLBP patients – and one that is low-tech, non-invasive and cost-effective. TCR

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