

## DOCUMENTATION FOR MAINTENANCE CARE, COST-EFFECTIVENESS, AND WHIPLASH

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### A.MAINTENANCE CARE:

► As part of a comprehensive geriatric assessment program, the RAND Corporation studied a subpopulation of patients who were under chiropractic care compared to those who were not and found that the individuals under continuing chiropractic care were:

\*Free from the use of a nursing home [95.7% vs 80.8%];

\*Free from hospitalizations for the past 23 years [73.9% vs 52.4%];

\*More likely to report a better health status;

\*More likely to exercise vigorously;

\*More likely to be mobile in the community {69.6% vs 46.8%}.

Although it is impossible to clearly establish causality, it is clear that continuing chiropractic care is among the attributes of the cohort of patients experiencing substantially *fewer* costly healthcare interventions.<sup>1</sup>

► A second review of a larger cohort of elderly patients across the United States compared direct expenditures [hospital care, physicians' services, nursing home] between groups of patients who were under maintenance chiropractic care and those who were not. Nearly a threefold savings of mean annual expenditures was reported as follows:

\*\$ 3,105 : Maintenance care

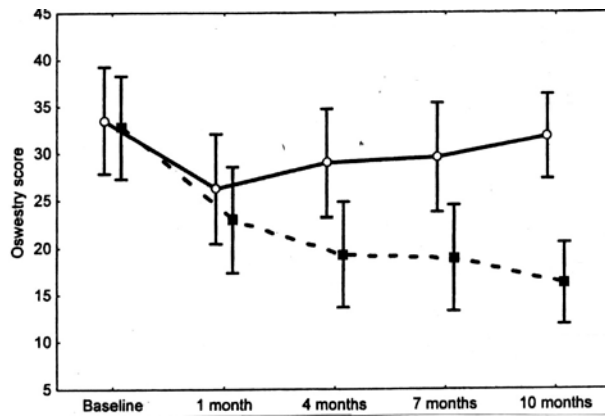
\*\$10,041 : No maintenance care<sup>2</sup>

► One study involving elderly populations reviewed the consequences of implementing an on-site industrial chiropractic program which included the early detection, treatment, prevention and occupational management of musculoskeletal injuries 2 days per week. For the 21 months after implementation of the program, the total number of days of lost time, costs per claim, rate premiums, and especially the number of surgeries decreased dramatically. Cost savings from avoided surgeries alone amounted to \$900,000 for these preventive measures.<sup>3</sup>

► An additional study recruited 59 adults aged 18-27 from two elite Australian Rules football teams and randomized them into intervention and control groups. The control group was administered standard club, medical, paramedical and sports science management, including medication, surgery, manipulative physical therapy, massage, strength and conditioning, and rehabilitation. The intervention group included all these procedures and added pragmatic chiropractic management, involving manual therapies and/or soft tissue therapies to the spine, pelvis, and lower extremities at a minimum weekly frequency for 6 weeks, then one treatment for every 2 weeks for a 3-month period. The chiropractic intervention resulted in the lower incidence of injuries to the hamstrings, lower limb muscles, and knees with far shorter periods of play missed as well. A lower incidence of overall back pain was also reported.<sup>4</sup>

Again the implications are that there may be considerable potential savings in direct costs spent for medical care with patients who are undergoing continuing chiropractic care on a maintenance basis. When return-to-work and other indirect costs are figured in (as implied in the Coulter study described above<sup>1</sup>, far greater savings would be expected.

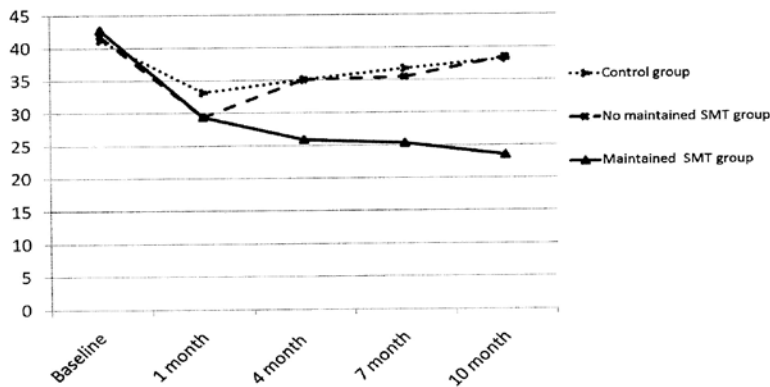
► Even more persuasive data of all comes from a recent study<sup>5</sup> of 29 patients with chronic low back pain who were divided into two groups, one receiving 12 treatments within a single month and the other adding to this regimen one treatment every 3 weeks for an extended 9 months (12-14 additional visits). In terms of disability (as indicated by a modified Oswestry questionnaire), the group receiving the supplementary maintenance treatments continued to improve throughout the entire 10 month period, while the cohort lacking the additional visits reverted to baseline levels within that same period. This is clearly depicted in the Oswestry scores over a 10-month period as indicated in **Figure 1**. The authors of this study speculate that repeated chiropractic visits may have been the direct cause for the improvement of disability scores due to (a) improved trunk mobility,<sup>6</sup> (b) facilitated release of entrapped synovial folds or relaxation of hypertonic muscle by sudden stretching,<sup>7</sup> or (c) the disruption of articular or periarticular lesions.<sup>8</sup>



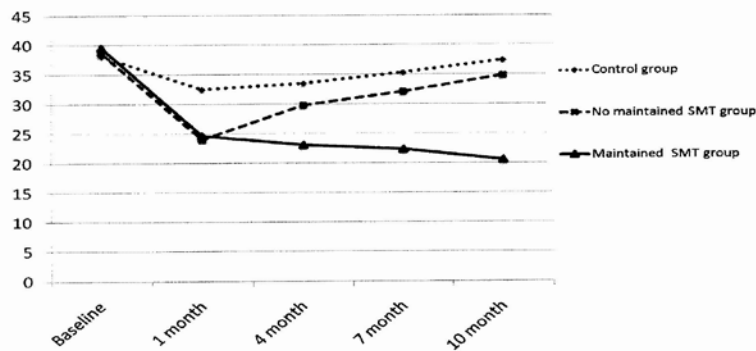
Dashed line: Including maintenance care  
 Solid line: Excluding maintenance care

**FIGURE 1: Disability Scores With and Without Maintenance Chiropractic Care<sup>5</sup>**

► An even larger patient sample [60] with chronic nonspecific low-back pain were divided into three groups: [a] receiving 12 treatments of sham spinal manipulation over a 1 month period, [b] receiving 12 treatments of active spinal manipulation over the same period, and [c] receiving 12 treatments of active spinal manipulation over the same period, followed by maintenance spinal manipulation every 2 weeks for the following 9 months. At 10 months, only the patients receiving the maintenance protocol (option [c]) experienced significantly lower pain and disability scores. Patients NOT receiving the maintenance therapy showed the same improvement at one month but returned to baseline levels at 10 months. These results are dramatically shown in **Figure 2A** and **Figure 2B**. Clearly, the maintenance regimen yielded tangible and long-lasting benefits.<sup>9</sup>



**FIGURE 2A: VAS Scores over a 10-Month Period<sup>9</sup>**



**FIGURE 2B: Oswestry Disability Scores over a 10-Month Period<sup>9</sup>**

► Workers Compensation data in Illinois, Massachusetts, Maryland, New Hampshire, New York, Texas, and Wisconsin involving 894 cases filing claims from January 1-December 31, 2006 revealed lower disability recurrence for patients under chiropractic care compared to similar patients treated by physical therapists or physicians. The hazard ratios, reflecting the likelihood of recurrence, were 1.0 for chiropractors, 1.6 for physicians, and 2.0 for physical therapists. Patients in the physical therapy group had the highest proportion of recurrent disability [16.9%]. Average weekly costs were \$122 higher during the disability period for those with recurrent disability than for those without. It was unclear whether the chiropractic benefit was indirect, preventing patients from receiving otherwise unproductive procedures that could slow rather than accelerate their recovery.<sup>10</sup>

#### REFERENCES:

- <sup>1</sup>Coulter ID, Hurwitz EL, Aronow HU, Cassata DM, Beck JC. Chiropractic patients in a comprehensive home-based geriatric assessment, follow-up and health promotion program. Topics in Clinical Chiropractic 1996; 3(2): 46-55.
- <sup>2</sup>Rupert RL, Manello D, Sandefur R. Maintenance care: Health promotion services administered to U.S. chiropractic patients age 65 and older. Journal of Manipulative and Physiological Therapeutics 2000; 23(1): 10-19.
- <sup>3</sup>Cooper SR, Pfefer MT. Development of an on-site industrial chiropractic program. Proceedings of the 9th Biennial Congress of the World Federation of Chiropractic, Vilamoura, PORTUGAL, May 17-19, pp. 202-204.
- <sup>4</sup>Hoskins W, Pollard H. The effects of sports chiropractic on the prevention of athletic injuries in elite athletes: A randomized, controlled trial. Proceedings of the 9th Biennial Congress of the World Federation of Chiropractic, Vilamoura, PORTUGAL, May 17-19, pp. 163-164.
- <sup>5</sup>Descarreux M, Blouin J-S, Drolet M, Papadimitriou S, Teasdale N. Efficacy of preventive spinal manipulation for chronic low back pain and related disabilities: A preliminary study. Journal of Manipulative and Physiological Therapeutics 2004; 27(8): 509-514.
- <sup>6</sup>Hewitt EG. Chiropractic care of a 13-year old with headache and neck pain: A case report. Journal of the Canadian Chiropractic Association 1994; 34(3): 160-162.
- <sup>7</sup>Aure OF, Nilsen JH, Vasseljen O. Manual therapy and exercise therapy in patients with chronic low back pain: A randomized, controlled trial with 1-year follow-up. Spine 2003; 28: 525-531.
- <sup>8</sup>Evans DW. Mechanisms and effects of spinal high-velocity, low-amplitude thrust manipulation: Previous theories. Journal of Manipulative and Physiological Therapeutics 2002; 25: 251-262.
- <sup>9</sup>Senna MK, Mchaly SA. Does maintained spinal manipulation therapy for chronic non-specific low back pain result in better long term outcome? Spine 2011; 1427-1437.
- <sup>10</sup>Cifuentes M, Willets J, Wasiak R. Health maintenance care in work-related low back pain and its association with disability recurrence. Journal of Occupational and Environmental Medicine 2011; 53(4): 396-404.

#### **B. COST-EFFECTIVENESS:**

##### Healthcare expenditures:

- In terms of spine care, annual expenditures rose 65% from 1997 to 2005 while the health status of individuals with spine problems failed to improve. This means that the money invested in this pursuit was not returning a sufficient value.<sup>1</sup>
- According to the 1998 Medical Expenditure Survey, total healthcare expenditures for back pain were \$90.7B, more than 15% of which represented the costs of prescription drugs.<sup>2</sup>

### Chiropractic and medical expenditures:

▶80% of the total cost of chiropractic treatment is billed from the chiropractor, whereas only 20% of the total medical costs of treatment appear on bills directly from the medical physician.<sup>3</sup> This is of paramount importance in accurately calculating the relative costs of chiropractic and medical treatment.

▶With an accurate assessment of case mix severity, demographics, and what constitutes an episode, Stano demonstrated from a large insurers' database that the mean total costs were \$1000 for each medical episode and \$493 for each chiropractic episode.<sup>4</sup>

▶If chiropractors were admitted into an integrative service as gatekeepers in an Independent Physicians' Association (IPA), hospital admissions were reduced by 43% and hospital days were cut by 58% with the average length of stay reduced by 34% over a 4-year period. These costs were compared to those of conventional health maintenance organizations which had not awarded primary care privileges to chiropractors.<sup>5</sup>

▶A 4-year retrospective claim analysis of another insurance plan revealed major savings for health plan members who held an additional chiropractic coverage benefit. This resulted in (a) lower total healthcare expenditures (\$1,463 vs \$1,671), (b) lower average back pain episode-related costs for back pain patients (\$289 vs \$399), (c) a reduction of claims through medical doctors, and (d) lower utilizations of plain radiographs, magnetic resonance imaging, back surgeries, and hospitalizations. The savings were even greater than those reported because all pharmacy costs, costs of physical therapy upon referral, and post-surgical patients were omitted.<sup>6</sup>

▶A recent Medicare study comparing the costs to beneficiaries treated by chiropractors to recipients of other types of healthcare revealed major savings. These who received chiropractic care had average Medicare payments per capita for all Medicare services was \$4,426, compared to \$8,103 for those lacking such care.<sup>7</sup>

### Workers' Compensation Studies:

▶According to records of workers' compensation disbursements to medical and chiropractic physicians, and physical therapists in the state of Georgia from 2006-2009 for back pain in workers compensation cases, chiropractors received 2% or less of the funds paid to medical physicians and just 1.4-11.7% of the disbursements paid to physical therapists.<sup>8</sup>

▶Data from the Division of Workers' Compensation Claims in Florida revealed significant savings when chiropractic was compared to non-chiropractic care for specific low back injuries during the period 1994-1999. Total claims were less than half for chiropractic care [\$7,500 vs \$16,500) and the average number of days required to return to work was reduced by 30% (77 vs 130).<sup>9</sup>

▶Workers' Compensation claims in Texas from 1996-2001 revealed that chiropractors treated 30% of workers with lower back injuries but accounted for just 9.1% of the total costs, 17.5% of medical costs.<sup>10</sup>

### REFERENCES:

<sup>1</sup>Deyo RA, Mirza SK, Turner JA, Martin BI, MPH. Overtreating chronic back pain: Time to back off? Journal of the American Board of Family Medicine 2009; 22(1): 62-68.

<sup>2</sup>Luo X, Pietrobon R, Sun SX, Liu GG, Hey L. Estimates and patterns of direct health care expenditures among individuals with back pain in the United States. Spine 2003; 29(1): 79-86.

<sup>3</sup>Manga P. Economic case for the integration of chiropractic services into the health care system. Journal of Manipulative and Physiological Therapeutics 2000; 23(2): 188-122.

<sup>4</sup>Stano M. The economic role of chiropractic: Further analysis of relative insurance costs for low back care. Journal of the Neuromusculoskeletal System 1995; 3(3): 139-144.

<sup>5</sup>Sarnat RL, Winterstein JL. Clinical and cost-effectiveness of an integrative medicine IPA. Journal of Manipulative and Physiological Therapeutics 2004; 27(5): 336-347.

<sup>6</sup>Legorreta AP, Metz RD, Nelson CF, Ray S, Chernicoff HO, DiNubile NA. Comparative analysis of individuals with and without chiropractic coverage. Archives of Internal Medicine 1994; 164: 1985-1992.

<sup>7</sup>Muse & Associates. Utilization, cost, and effects of chiropractic care on Medicare program costs. Washington, DC, July 2001.

<sup>8</sup><http://sbwc.georgia.gov/portal/site/SBWC/menuitem.2f54fa407984c51e93f35eed03036a0/?vgnextoid=e8b934a359b45210VgnVC M100000bf01020aRCRD>

<sup>9</sup>Folsom BL, Holloway RW. Chiropractic care of Florida workers' compensation claimants: Access, costs and administrative outcome trends from 1994 to 1999. Topics in Clinical Chiropractic 2002; 9(4): 33-53.

<sup>10</sup>MGT of America. Chiropractic treatment of workers' compensation claimants in the state of Texas. Final report submitted to the Texas Chiropractic Association, February 2003.

## **C. WHIPLASH:**

► The problem facing both diagnosticians and victims facing whiplash is that most moderate to severe cases are invisible upon standard medical examination. As elusive as the "smoking gun" might be regarding this condition, it involves a broader array of soft tissue, neurological, and temporomandibular joint problems than presumed only a decade ago.<sup>1</sup> In Quebec alone, the fact that whiplash in 1989 accounted for 20% of all traffic injury insurance claims with an average compensation period of 108 days<sup>2,3</sup> led the Quebec Task Force on Whiplash and Associated Disorders to conclude that "neck pain is to the automobile what low back pain is to the workplace."<sup>4</sup>

► The elusiveness of a definitive, reproducible pathology for whiplash-associated disorders [WAD] have often led the legal and insurance communities as well as the medical to erroneously conclude that there is no physical or organic basis for the symptoms of WAD. This has produced charges of malingering or litigation neurosis on the part of the patient, leading to the overlaying of psychosocial factors which have only compounded the problem.

► Because WAD has been such an elusive target, the work of the Quebec Task Force has not been able to escape criticism. Freeman<sup>5</sup> has raised several objections to the Task Force Guidelines, including the following:

1. Near total elimination of relevant literature. The fact that 99.994% of all articles were eliminated before consideration raises a strong possibility that instructive as well as useless data were discarded.
2. Arbitrary recommendations: In the resulting absence of literature to consider, the Task Force gave its own opinion equal weight with primary research data, lending a misleading sense of robustness to its recommendations.
3. Propagation of the myth that most WAD patients recover in 6-12 weeks: Upon closer examination, this time course has no basis in primary research; in fact, considerable data already cited contradicts this impression and paints a far bleaker picture.<sup>6-13</sup>
4. The undertaking was sponsored by an insurance industry: SAAQ [Societe d'assurance automobile du Quebec] as the sponsoring organization of the entire project would be expected to have an "obvious and serious" interest in its outcome, possibly compromising the objectivity of the literature research evaluation, and ultimate recommendations of the Task Force.

► From a morphological point of view, immobilization of the neck following the soft tissue trauma which accompanies WAD is indefensible. Severe soft tissue injury [rupture of muscles, joint capsules, and synovial folds] can be expected around the cervical spines of accident victims.<sup>6</sup> Consequently, scar formation, cross-linking of collagen fibers, and adhesions might be expected to result in traumatized soft tissues that were not rehabilitated soon after injury. Specifically:

1. Healing without proper motion will cause a disorganized matrix to appear, with adhesions and unnecessary scar formation.<sup>8,9</sup>
2. Early exercise and joint motion in rehabilitation produces a better collagen concentration, which is superior to scar tissue.<sup>9</sup>
3. Improved tensile strength is observed in the collagen deposit when proper rehabilitation takes place after injury.<sup>10,11</sup>
4. If venous blood supply to paraspinal muscles is depressed for 2 hours [which might be anticipated in some soft tissue injuries], irreversible muscle damage occurs.<sup>12</sup> With decreased vascularization, rapid degeneration of the muscle spindles occurs—with subsequent revascularization changing their shape and neural innervation.<sup>13</sup>

► A plausible rationale exists for managing whiplash by spinal manipulation; however, the outcomes evidence in support of this remains limited:

► One study demonstrated that, in subjects whose side bending of the neck was asymmetrical and who had a history of neck trauma and frequent episodic neck stiffness, a single lower cervical adjustment delivered to the side of the most restricted movement was capable of reducing the extent of asymmetry, but only briefly (for periods less than 48 hours).<sup>14</sup>

► A second investigation involving 93 patients in a retrospective review by structured telephone interviews indicated that those with restricted range of neck movement following whiplash injury were the most likely to improve after chiropractic manipulation. Many patients had received previous treatments, particularly physiotherapy.<sup>15</sup>

► Additional supporting evidence might be inferred from a prospective study of 23 patients with subacute whiplash-associated disorders who reported an increased cervical range of motion and reduced pressure-pain threshold after cervical spine adjustments,<sup>16</sup> as well as one case study involving an unstable C3/C4 motor segment following a lateral-impact motor collision.<sup>17</sup>

## REFERENCES:

<sup>1</sup>Foreman SM, Croft AC. Whiplash Injuries: The Cervical Acceleration/Deceleration Syndrome, 2nd Ed. Baltimore, MD: Williams & Wilkins, 1995.

<sup>2</sup>Girard N. Statistiques descriptives sur la nature des blessures. Quebec. Regie de l'assurance automobile du Quebec. Direction des services medicaux et de la readaptation. Internal document. Quebec, 1989.

<sup>3</sup>Giroux M. Les blessures a la colonne cervicale. Importance du probleme. Le Medicin du Quebec, Montreal, September 22-26, 1991.

<sup>4</sup>Spitzer WO, Skovron ML, Salmi LR et al: Scientific monograph of the Quebec Taskforce on Whiplash Associated Disorders: Redefining "whiplash" and its management. Spine 1995; 20: 1S-73S.

<sup>5</sup>Freeman MD, Croft AC, Rossignol AM. "Whiplash associated disorders: Redefining whiplash and its management" by the Quebec Task Force. Spine 1998; 23(9): 1043-1049.

<sup>6</sup>Jonsson H, Bring G, Rauschnig W, Sahlstedt B. Hidden cervical spine injuries in traffic accident victims with skull fractures. Journal of Spinal Disorders 1991; 4(3): 251-263.

<sup>7</sup>Akeson WH, Amiel D, Mechanic CL, Soo SL-Y, Harwood FC, Hamer ML. Collagen cross-linking alterations in joint contractures. Changes in the reducible cross-links in periarticular connective tissue after nine weeks of immobilization. Connective Tissue Research 1977; 5: 15-19.

<sup>8</sup>Frank C, Woo SL-Y, Amiel D, Harwood F, Gomez M, Akeson W. Medical collateral ligament healing--a multidisciplinary assessment in rabbits. American Journal of Sports Medicine 1983; 11: 379-389.

<sup>9</sup>Long ML, Frank C, Schachlan NS, Dittrick D, Edwards GE. The effects of motion on normal healing ligaments [Abstract]. Proceedings of the Orthopedic Research Society 1982; 7: 43.

<sup>10</sup>Fronck J, Frank C, Amiel D, Woo SL-Y, Coutts RD, Akeson WH. The effects of intermittent passive movement [IPM] in the healing of medical collateral ligament [Abstract]. Proceedings of the Orthopedic Research Society 1983; 8: 31.

<sup>11</sup>Gelberman RH, Manske PR, Akeson WH, Woo SL-Y, Lundborg G, Amiel D. Flexor tendon repair. Journal of Orthopedic Research 1986; 4: 119-128.

<sup>12</sup>Crock H. Low back surgery. International Chiropractic Conference, London, England, September 1987.

<sup>13</sup>Baker D. Development and regeneration of mammalian muscle spindles. Scientific Progress 1984; 69: 45- 64.

<sup>14</sup>Nansel D, Peneff A, Cremata E, Carlson J. Time course considerations for the effects of unilateral lower cervical adjustments with respect to the amelioration of cervical lateral-flexion passive end-range asymmetry.. Journal of Manipulative and Physiological Therapeutics 1990; 13(6): 297-304.

<sup>15</sup>Khan S, Cook J., Gargan M, Bannister G. A symptomatic classification of whiplash injury and the implications for treatment. Journal of Orthopaedic Medicine 1999; 21(1): 22-25.

<sup>16</sup>Suter E, Harris S, Rosen M, Peterson D. Cervical spine adjustment improves muscle strength of the upper extremities in patients with subacute whiplash. Symposium Proceedings, World Federation of Chiropractic 6th Biennial Congress, pp. 229-230.

<sup>17</sup>Kessinger RC, Boneva DV. Case study: Acceleration/deceleration injury with angular kyphosis. Journal of Manipulative and Physiological Therapeutics 2000; 23(4): 279-287.