Chapter 11:
Frequency & Duration Recommendations

Introduction

While in 2005, Chiropractic care was less than 0.28% (5.5 billion[1]/2.0 trillion[2]) of the USA national health care budget, in 1998, utilization of Chiropractic in USA Workers Compensation was reported as 2.9%.[3] In five recent Workers Compensation reports in the USA, no data was provided for Chiropractic utilization.[4-8]

In a 2008 review of several international reports on costs of Workers Compensation (Australia, Sweden, United Kingdom, USA, and Korea), no data was presented for Canada and only one report was cited for the USA.[9] It has been estimated that, "among studies providing a break down on direct costs, the largest proportion of direct medical costs for LBP was spent on physical therapy (17%) and inpatient services (17%), followed by pharmacy (13%) and primary care (13%)."[9] While only 3% was reported for Chiropractic Workers Compensation costs in the USA,[4] Dagenais et al[9] reported an average of 5% from studies in Australia, Sweden, United Kingdom, USA, and Korea. This data is very misleading because these authors stated, below their Table 3, that "Chiropractic" included Osteopathy costs. Since Osteopathy has a bigger percentage of the health care pie world-wide than does Chiropractic, it is likely, based on this data, Chiropractic represents less than 2% in industrial nations.

Therefore, in most countries, if Chiropractic was totally eliminated, very little savings in national Workers Compensation budgets would occur. This fact is in direct opposition to the restriction of Chiropractic in most Canadian Provinces and USA States Workers Compensation guidelines. It is a known fact that costs of CAM (Complimentary and Alternative Medicine - Chiropractic) utilization is less than that for standard medical care.[10] Thus, to reduce Workers Compensation budgets, it becomes apparent that standard Medical Care and Physical Therapy also need to be audited and guidelines developed to reduce costs within these two areas, not merely in Chiropractic.

In developing comprehensive Chiropractic Guidelines, this ICA document presents an evidence-based set of Frequency and Duration Programs based on Randomized Clinical Trial (RCT) pain data. Even though as chiropractors our focus in treating the patient is often the chiropractic subluxation, we will be looking at information on how this focus has been documented to help people in terms of symptoms and body function. We begin with RCTs involving uncomplicated mechanical neck pain (NP) and low back pain (LBP).

While uncomplicated, "mechanical neck pain", and, "mechanical low back pain", commonly may be assumed to be the easiest of human ailments to resolve with chiropractic care, our detailed analysis of data, from RCTs studying spinal manipulative therapy (SMT) and mobilization as the treatment for these conditions, provides a markedly different conclusion. Comprehensive data analysis of this published data contradicts claims of a resolution of axial pain in 6 to 12 SMT visits, commonly touted by insurance companies, managed care organizations, some chiropractic college faculty, and paid insurance claims reviewers performing Independent Medical Examination's (IME's).[11-19]

This analysis of RCTs with SMT as the treatment is discussed in the next subsection. This analysis provides a projected Frequency and Duration of care for axial pain conditions. This, of course, then begs the question, 'How should a clinician propose treatment with complicated pain cases?' Since treatment parameters currently seem based on uncomplicated pain, complications such as disc degeneration, spinal osteoarthritis, fractures, ligament injuries (spondylolysis with antero- or postero-listhesis), co-morbidity, etc., must be addressed. We provide an answer to these questions by suggesting appropriate alterations in the recommended basic Frequency and Duration derived for approaching simple Axial Pain.

Besides patients seeking Chiropractic care with "uncomplicated" and "complicated" neck and back pain conditions, this whole ICA document is about patients with diseases that are non-musculoskeletal in nature (such as the so-called type "O" disorders). Additionally, this ICA document presents Frequency and Duration programs of care for injured patients who need to receive Rehabilitative Care, not just to achieve minimal pain relief or simply symptomatic remission.

Since pain relief in uncomplicated, "mechanical neck pain", and, "mechanical low back pain", may seem to be easiest of human ailments to resolve, we begin with an analysis of RCTs (Level 1 evidence), with SMT as the treatment, as a basis to arrive at a reasonable, scientifically supported (evidence-based) program of care (i.e., Frequency & Duration). Once this has been achieved, we can then add to this basic program of, "Frequency & Duration", when cases have complications, complicating co-morbidities, non-musculoskeletal conditions, diseases, or need Rehabilitative Care. We present these Frequency and Durations of care with Level 2-4 evidence from our previous Section with ICA's Best Practices data.

While it would be impossible to present an evidence-based Frequency and Duration Chiropractic program of care for every named disease condition, we suggest alterations in basic Axial Pain Frequency and Duration program of care for these disease Conditions.

It is important to stress that guidelines are merely guides to care, and are not hard-line prescriptions for treatment duration. The patient is always the ultimate guide to the need for care, which is why these ICA Guidelines recommend frequent follow-up examinations to measure the patient's progress.

The ICA has defined subluxation as, "any alteration of the biomechanical and physiological dynamics of contiguous spinal structures which can cause neuronal disturbances". The biomechanical definitions and descriptions are published in Section V of PCCRP (www.pccrp.org). These definitions are quantifiable and give the practicing chiropractor a goal of care for correction of subluxation. The biomechanical descriptions are consistent with State and Federal Laws under Medicare. The importance of these facts is that some ICA members do not dwell on pain syndromes, but locate and correct subluxations. This document strongly advocates subluxation treatment and correction independently of symptoms as it is the basic health tenent of chiropractic to do this. The prior 10 Sections of this chapter were concerned with pain syndromes and did not have frequency and durations for subluxations and other co-morbidities. For those DCs performing spinal subluxation correction, we present a guide for frequency and duration in this section based on published research data.

Since many disease processes remiss under chiropractic care and since historically chiropractors worked on spinal subluxations regardless of the patient's ailment, it is the ICA's position that ICA members who address the vertebral subluxation regardless of the patient's condition need suggested frequency and duration guidelines. Though this is important it need not neglect each individual case scenario nor the experience and expertise of the doctor to know how much treatment a patient needs coupled with the expressed desire of their chiropractic patient in a chieving a health goal set with their doctor.

DCS utilize a variety of checks to determine the presence of subluxation. Some of these were supported in Chapter 7 on Outcome measures. Thus, we apply the ICA's basic 6 programs of frequency and duration. From Section 3 of this chapter, the determination for more care past the initial basic program of 25 visits in 11 weeks, if needed, will be based on the x-ray findings, anatomical, and/or physiological findings that the attending DC uses pre- and post-care, i.e. follow-up examinations. Thus, the same 6 basic ICA programs of frequency and duration will be applied regardless of disease, condition, or ailment.

Additionally, it should be noted that guidelines leave out one important component, patient choice. If a patient has not identifiable disease process but wants his/her subluxations corrected, then this choice must be made available.

We have organized this chapter into 10 categories that generally result in longer programs of Frequency and Duration as more complicated factors are encountered:

Frequency & Duration Programs to be Presented

I. Uncomplicated Mechanical Axial Pain from RCTs
II. Slowly recovering Patients with Axial Pain (Dose-Response)
III. Axial Pain with Complicating Factors
IV. Headaches
V. Geriatrics: USA Medicare Laws as a Standard
VI. Motor Vehicle Accidents
VII. Trauma Patients (Workers Compensation, Home & Recreational injuries)
VIII. Pediatrics (data from ICA's Best Practices in Chapter 10)
IX. Structural Rehabilitation of Subluxation (Upper Cervical, Posture, Sagittal Curves)
X. Wellness, Maintenance, Stabilization Care (Subluxation correction, diet, exercise, mental health, social wellbeing)

I. Frequency & Duration of Chiropractic Care for Uncomplicated Axial Pain

In the ICA Best Practices data base in Chapter 10, in Section II of this document, we identified 128 RCTs on low back pain, upper back pain, neck pain, and headaches.[20-147] We will present a Frequency and Duration program of care for subjects with uncomplicated Axial Pain. The evidence-based support for our pain improvement analysis of these 128 RCTs (with only 45% improvement) has been validated by its appearance in Indexed Journals.[148-149]

From searches in PubMed, CINAHL, Mantis, and the Index of Chiropractic Literature, these 128 RCTs on axial pain were found and entered into our ICA data base. Key words searched were spinal manipulative therapy, spinal manipulation, manipulation, mobilization, chiropractic technique, randomized clinical trials (RCTs), low back pain, acute low back pain, sub-acute low back pain, chronic low back pain, acute neck pain, sub-acute neck pain, chronic neck pain, cervicogenic pain, and headaches (including migraine).

Low Back Pain RCTs

Of the 128 RCTs on axial pain with SMT as the treatment, 74 of those RCTs concerned the condition of low back pain,[20-93] but 9 of these RCTs were follow-up publications on a previous study.[28,57,61-63,69,70,72,83] Thus, only 65 RCTs were analyzed. The data from these 65 RCTs were entered into table format (see Table 1). The readers were to determine:

(a) lead author and year of publication,
(b) duration of low back pain (acute is defined as less than 4 weeks, sub-acute is between 4 weeks and 3 months, and chronic is 3 months or longer or more than one re-occurrence),
(c) number of subjects treated with SMT/mobilization,
(d) treatment given (if extra modalities were added to SMT),
(e) number of visits,
(f) pain scores (Numerical Rating Score = NRS and VAS/10 = Visual Analogue Scale divided by 10), and
(g) what professionals provided the treatment.

After completion of a table with items (a)-(g), the data were analyzed by determining the total number of subjects in these RCTs, the average number of visits, the total initial pain score, the total follow-up pain score (follow-up was determined to be the first date of follow-up after treatment ended), and the percent improvement. It was noted that 29 out of these 65 RCTs did not report pain data in the form of VAS or NRS.

Table 1
Analysis of 74 RCT publications with SMT and/or Mobilization for Low Back Pain.

Low Back Pain RCT	Type LBP A, SA, C	# Treated patients	Treatment SMT, Mobilization	# visits	Pain score VAS/10 =NRS pre/post	Care by DC,MD, DO, PT?
Andersson et al, 1999[20]	SA	83	Osteo SMT*	12	4.9 / 3.2	DO
Arkuszewski, 1986[21]	A,SA,C	50	SMT-T-Mass	6.2	6.0 / 2.0	MD
Aure, 2003[22]	Chronic	27	SMT/Mobil	16	5.5 / 2.2	PT
Beyerman et al, 2006[23]	NR	124	SMT/Flex-D	20	4.25 / 1.9	DC
Blomberg et al, 1994[24]	A & SA	48	SMT/Steroi	5.5	NR	MD/PT
Bronfort et al, 1996[25]	Chronic	71,51	SMT	10	5.4 / 3.7	DC
Bronfort et al, 1989[26]	A, SA, C	10	SMT	7	NR	DC
Burton et al, 2000[27]	LBP	20	Osteo SMT	6-18	3.79 / 2.68	DO
Cherkin et al, 1998[29]	LBP	133	SMT	6.9	5.5 / 2.0	DC
Childs et al, 2006[30]	LBP	70	SMT/Exerci	NR	NR	PT
Cleland et al, 2007[31]	A,SA,C	80	SMT/Exerc	5	Not completed	PT
Coxhead et al, 1981[32]	LBP	8G of 16	SMT-Mait	5-10	NR	PT
Delitto et al, 1993[33]	Acute	14	SMT/Exerc	3	NR	PT
Doran et al, 1975[34]	A, SA, C	116	SMT & Mob	6	NR	MD
Eisenberg et al, 2007[35]	Acute	76	Drugs&SMT	7	NR	DC
Erhard et al, 1994[36]	A & SA	12	SMT/Rockin	3	NR	PT
Evans et al, 1978[37]	Chronic	15,17	SMT/codeine	9	NR	MD
Farrell,Twomey, 1982[38]	Acute	24	SMT & Mob	9	4.9 / 0.4 (Fig1)	PT
Ferreira et al, 2007[39]	Chronic	80	SMT/Mobil	12	6.2/4.1	PT
Gemmell et al, 1995[40]	Acute	30	Meric,Activat	1	4.74 / 2.54	DC
Gibson et al, 1985[41]	Chronic	41	Osteo SMT	4	3.5 / 2.1	DO
Giles et al, 1999 [42]	Chronic	23	SMT	6	5.0 / 2.5	DC
Giles & Muller, 2003[43,71]	Chronic	33	SMT	18	5.0 / 2.5	DC

Low Back Pain RCT	Type LBP A, SA, C	# Treated patients	Treatment SMT, Mobilization	# visits	Pain score VAS/10 =NRS pre/post	Care by DC,MD, DO, PT?
Glover et al, 1974[44]	A, SA, C	43	SMT+DSW	1+4	NR	PT
Godfrey et al, 1984[45]	Acute	22,22	SMT+STorE	5	NR	MD/DC
Gudavali et al, 2006[28,46]	Chronic	110	Flex-Dist/Ex	8-16	3.8 / 1.7	DC,PT
Haas et al, 2004[47]	Chronic	4G of 18	SMT ± PT	3,6,9,12	4.9 / 2.9 ave	DC
Hadler et al, 1987[48]	Acute	26	SMT	1	NR	MD
Hancock et al, 2007[49]	Acute	59	SMT/drug	9.2	6.7/6.2	PT
Hawk et al, 2006[50]	Chronic	41 LBP	BESTvSMT	8-12	NR	DC
Hemmilia eta l, 2002[51]	SA & C	44	SMT:BoneS	10	NR	MD
Herzog et al, 1991[52]	Chronic	16	SMT	10	3.2 / 1.8 (Fig)	DC
Hoehler et al, 1981[53]	A, SA, C	56	SMT	4.8	NR	MD
Hoiriis et al, 2004[54]	A,SA	34	SMT/Grostic	7	4.52 / 2.44	DC
Hsieh et al, 2002[55]	Acute	49	SMT	9	3.66/ 2.58	DC
Hsieh et al, 1992,94[56,73]	SA & C	69	SMT(Divers)	9	Improved 2.4	DC
Hurley et al, 2004,05[57,58]	Acute	80	SMT/Mob	4-10	5.21 / 3.22	PT
Hurwitz et al, 2002[59]	A, SA, C	169	SMT	3.2,	4.5 /2.5	DC
Kinalski et al, 1989[60]	NR	61	SMT/Ex/Mob	NR	NR	MD
Koes et al, 1993,1992,1992[61-64]	SA & C Pain>6w	52 LBP 13 had NP	SMT/Mob	5.4	7.0 / 3.6	PT,MT
Licciardone et al, 2003[65]	Chronic	91	Osteo SMT	7	NR	DO
MacDonald et al, 1990[66]	A,SA, C	49	OsteoSMT	5	NR	DO
Maige et al, 2006[67]	Chronic	50	Intrarectal	3	6.2 / 4.1	MD
Mathews et al, 1987[68]	A & SA	33, 132	SMT	≈10	NR	PT
Meade et al, 1990,95[69,70]	A, SA, C	384	SMT	9	NR	DC
Ongley et al, 1987[72]	Chronic	40	SMT/Exer/ Injections	6	3.99 / 3.06	MD
Postacchini et al, 1988[74]	A,SA,C	87	SMT	16-22	NR	DC
Rasmussen, 1979[75]	Acute	12	SMT	6	92% symp free	PT,MD
Rasmussen, 2003[76]	SA, C	20	Mob/Trac	6	3.2 / 2.4	PT
Rupert et al, 1985[77]	A,SA,C	48	SMT	4	45% reduction	DC
Santilli et al, 2006[78]	Acute	53	SMT/Gonst	20	6.4 / 2.0	DC
Seferlis et al, 1998[79]	Acute	57	SMT/AutoT	10	4.1 / 3.6	PT
Shearar et al, 2005[80]	Chronic+	30,30	SMT/Activat	4	4.9 / 2.4	DC
Sims-Williams et al, 1978[81]	A, SA, C	31	SMT/Mob/T Maitland	14	NR	PT
Sims-Williams et al,1979[82]	Chronic	48	SMT/Mob	14	NR	PT
Skargren et al, 1997,1998[83-84]	A, SA, C	41 NP, 138 LBP	SMT-PT	7	5.6 / 2.0	DC
Timm, 1994[85]	Chronic	50	SMT	24	NR	PT
Triano et al, 1995[86]	Chronic	47	SMT	12	3.8 / 1.3	DC
UK Beam Trial,2004[87]	SA,C	353 + 333	BC/SMT,Ex	17	6.07 / 4.09	DC,PT
Waagen et al, 1986[88]	Chronic	9	SMT	4.2	3.5 / 2.2	PT
Wand et al, 2004[89]	Acute	NR	NR	NR	NR	PT
Waterworth et al 1985[90]	Acute	38	SMT/McKe	10-12	7.0 / 3.5	PT
Williams et al, 2003[91]	A & SA	72	SMT/NSAID	4	3.81/ 2.42	DO

Low Back Pain RCT	Type LBP A, SA, C	# Treated patients	Treatment SMT, Mobilization	# visits	Pain score VAS/10 =NRS pre/post	Care by DC,MD, DO, PT?
Wreje et al, 1992[92]	A & SA	18	SMT	1	4.0 / 4.0	MD
Zylbergold,Piper, 1981[93]	NR	8	SMT/Heat	8	5.8 / 2.8	PT
Means/Totals (# subjects, Pain, #DC studies)		N = 4,661 in 66 RCT	45/65 more than SMT	517.2/62 = 8.34 v	176.54/ 101.33 42.6% better	24 with DCs

***** Methods have additional treatments (Flexion-distraction, **Mob** = mobilization, **E** = exer =Exercise, **T** = trac = traction, **AutoT** = AutoTrcaction, **Mass** = massage, Inject = drug injections, **BCare** = Uk's Best Care, etc).
NR = Not Reported, **A** = Acute LBP (< 4 weeks), **SA** = Subacute LBP (4wks ≤ Pain <12 weeks), **C** = Chronic (pain > 3 months) or multiple occurrences[+]. 29 out of 66 RCTs did not report VAS or NRS

RCTs on Headaches, Neck pain, & Upper Back Pain

Of the 128 RCTs on axial pain with SMT as the treatment, 54 of these RCTs concerned the conditions of headaches, neck pain, cervicobrachial pain, and/or upper back pain,[94-147] but 7 of these RCTs were follow-up publications on a previous study. Thus, only 47 RCTs were analyzed. As was done with the low back pain RCTs utilizing SMT as a treatment, the data from these 47 RCTs were entered into table format (see Table 2). The manuscript readers were to determine:

(a) lead author and year of publication,
(b) duration of low back pain (acute is defined as less than 4 weeks, headache, neck pain, or upper back pain study,
(c) number of subjects treated with SMT/mobilization,
(d) treatment given (if extra modalities were added to SMT),
(e) number of visits,
(f) pain scores (Numerical Rating Score = NRS and VAS/10 = Visual Analogue Scale divided by 10), and
(g) what professionals provided the treatment.

After completion of a table with items (a)-(g), the data were analyzed by determining the total number of subjects in these RCTs, the average number of visits, the total initial pain score, the total follow-up pain score (follow-up was determined to be the first date of follow-up after treatment ended), and the percent improvement. It was noted that 6 RCTs did not report pain data in the form of VAS or NRS.

Table 2

Analysis of 54 RCTs for Neck Pain (NP), Upper Back Pain (UBP), and Headaches (HA)

Neck Pain , Upper Back pain, & Headaches RCTs	Type HA, NP, UBP	# Treated patients	# visits	Pain: NRS VAS/10 Pre/post	Treatment by DC, MD, DO, PT?
Allison et al, 2002[94]	Cervico-brachial	10,10	12	4.8/2.7	PT
Boline et al, 1995[95]	Tension HA	70	12	2.8/2.15 ratio	DC
Bove, Nilsson, 1998[96]	Tension HA	36	8	3.7/3.8	DC
Brodin, 1982[97]	Chronic NP	23	9	NR	PT
Bronfort et al, 2001[98]	Chronic NP	64	24	5.7 / 3.7	DC
Cassidy et al, 1992[99]	Mechanical NP	52,48	1	3.4/2.1	DC
Cleland et al, 2005[100]	Mechanical NP	19	3.7	4.16/2.56	PT
Cleland et al, 2007[101]	Mechanical NP	30	1	5.3/2.7	PT
Coppieters, 2003[102-104]	Cervico-brachial	10	1	7.3/5.8	PT
Donkin et al, 2002[105]	Tension HA	15,15	9	4.03/1.47 & 4.5/2.39	DC

Neck Pain , Upper Back pain, & Headaches RCTs	Type HA, NP, UBP	# Treated patients	# visits	Pain: NRS VAS/10 Pre/post	Treatment by DC, MD, DO, PT?
Evans et al, 2002[106]	Chronic NP	50, 51	20	5.6/2.9 5.6/2.4	DC
Giles & Muller, 1999[107]	Chronic pain	23 NP	6	4.5 / 1.5	DC
Giles & Muller, 2003[108]	Chronic pain	25 NP+LBP	18	NP : 6.0/3.0	DC
Haas et al, 2004[109]	HA, Neck Pain	7, 8, 8	3, 9, 12	HA :5.14/4.05 NP: 6.6/4.19 HA: 6.12/3.13 NP: 5.87/2.96 HA: 4.5/1.87 NP: 4.96/2.25	DC
Hemmilia et al, 2005[110]	HA,NP,UBP	22	5	5.06/1.85	Bone Setter
Hoving et al, 2002[111,112]	Neck Pain	60	6	5.9/3.5	PT
Howe et al, 1983[113]	HA,NP,radic pain	26	1-3	NR	MD
Hoyt et al, 1979[114]	Tension HA	10	1	5.4/2.9 ratio	DO
Hurwitz et al, 2002[115,116]	Neck Pain	171	1	4.8 / 2.6	DC
Jensen et al, 1990[117]	Post-traumatic HA	10	2	2.1/1.6	MD
Jordan et al, 1998[118]	Chronic NP	33	12	4.3 / 2.0	DC
Jull et al, 2002[119]	Cervico-genic HA	49,51,51	8-12	5.1/1.8	PT
Karlberg et al, 1996[120]	NP & Dizziness	17	13	5.6/3.3	PT
Koes et al, 1993[121,122]	NP & LBP	20 NP	5.4	7.0/3.0	Manual Ther
McKinney, 1989[123]	Acute NP	71	10	5.3/NR	PT
McReynolds, 2005[124]	Acute NP	29	1	6.1/3.3	DO
Mealy et al, 1986[125]	Acute NP	31	16	5.7/1.7	PT
Nelson et al, 1998[126]	Migraine	56,50	14	4.7/4.2	DC
Nilsson, 1995[127]	Chronic HA	20	6	4.7/2.7	DC
Nilsson, 1996-97[128-129]	HA	28	6	4.4/2.8	DC
Nordemar 1981[130]	Acute NP	10	6	9.7/1.8	PT
Palmgren et al, 2006[131]	Chronic NP	18	3-5	5.12/2.22	DC
Parkin-Smith, 1998[132]	Mechanical NP	13, 17	6	3.39/1.72 3.3/1.32	DC
Parker et al, 1978[133]	Migraine HA	30	7.5	4.9/2.8	DC
Savolainen, 2004[134]	NP, UBP	24	4	4.4/3.6	MD
Skargren, 1997-98[135,136]	NP & LBP	41 NP, 138LBP	7	5.6 / 2.0	DC
Skillgate et al, 2007[137]	NP & LBP	131NP + 75LBP	6	5.5/3.2	Naprapath
Sloop et al, 1982[138]	Chronic NP	21	1	Improved 1.8	MD
Tuchin et al, 2000[139]	Migraine HA	83	16	7.96/6.9	DC
van Schalkwyk 2000[140]	Mechanical NP	15,15	10	3.58/1.35	DC
Vernon et al, 1990[141]	Chronic NP	5	1	NR	DC
Whittingham, 2001[142]	Cervicogenic HA	49 55	9 9	NR	DC
Williams et al, 2003[143]	Neck pain, LBP, Upper back pain	23 NP	3-4	4.21/2.82	DO
Wood et al, 2001[144]	Neck Pain	15, 15	8	5.25/2.35 4.8/1.87	DC
Ylinen et al, 2007[145]	Chronic NP	61	8	5.0/2.4	Massage Ther

Neck Pain , Upper Back pain, & Headaches RCTs	Type HA, NP, UBP	# Treated patients	# visits	Pain: NRS VAS/10 Pre/post	Treatment by DC, MD, DO, PT?
Yurkiw et al, 1996[146]	Subacute NP	14	1	3.29/2.11	DC
Zaproudina, 2007[147]	Chronic NP	35	5	4.95/1.79	Bone Setter
Totals (# Patients, Mean Pre- & Post Pain & Mean Visits)		2,069	314.1/41 = 7.7 Mean	252.39/135.12 Mean= 46.5% improved	23 RCTs by DCs

NR = Not Reported. Only 41 RCTs provided data on visits and VAS or NRS.

Number of Visits Necessary to Resolve Uncomplicated Mechanical Axial Pain

From the initial and follow-up pain data presented in these 128 RCTs with SMT as treatment for headaches, neck pain, upper back pain and low back pain, it is obvious that the 6,730 subjects were not symptom free. In fact, Table 3, which summarizes the average data from these 128 RCTs in Tables 1 and 2, indicates that average pain improvement over an average of 8.1 visits provided was approximately just under 45%.

Table 3
Average Data from 128 RCTs (74 LBP + 54 NP) with SMT as Treatment from Tables 1 & 2

Condition	# Subjects	# Visits given	Mean Initial, post Pain (N=86)	% improvement
Low back pain	N = 4,661	8.34 average	176.54, 101.33	42.6%
HA, NP, UBP	N = 2,069	7.7 average	252.39, 135.12	46.5%
Total/Averages	6,730	8.1	428.93, 236.45 = 55.1% Ave NRS: 5.0/2.8	44.9%

By examining data in Table 3, there were an average of 8.1 visits and just under 45% improvement in pain in 128 RCTs in Tables 1 and 2, where treatment involved SMT. We note 15 RCTs were follow-ups of previously published clinical trials out of 128 RCTs in Tables 1 and 2 combined. We note 36 out of the 115 RCTs did not report the number of visits or VAS and we note several other modalities were included as treatment in 6,730 total subjects.

While many claim axial pain should resolve in 6-12 SMT visits,[11-19] the actual truth shows a much higher number of visits is necessary. Using the RCT data on the number of visits and improvement in pain scores in Table 3, a constant linear extrapolation can be used to determine a reasonable theoretical average number of visits/adjustments/treatments needed to completely resolve simple mechanical axial pain:

$$\text{Estimated Care } (\mathbf{EC}) = (\text{average visits})(100\%)/(\%\text{ of average improvement}) \quad (1)$$
$$= 8.1(100)/45$$
$$= \underline{18 \text{ visits}}$$

Instead of releasing a patient as soon as he/she has reached some expected amount of improvement, the patient should be monitored for a few weeks to insure that relapses do not occur (stabilization care). We suggested a conservative 4 weeks at one visit per week herein for stabilization care after initial symptomatic improvement has been achieved.[148-149] While equation (1) provides an estimated number of chiropractic visits to resolve simple mechanical axial pain, it does not include stabilization care or examinations. All RCTs have an initial examination visit before randomization and have multiple follow-up examinations not included in reports of actual treatment. If we only include the minimum number of follow-up examinations (follow-up after intensive care program and

follow-up after 4 weeks of stabilization care), then equation (2) provides a reasonable theoretical total number of visits for documentation, resolution, and stabilization of simple low back pain:

Total SMT Visits = 1 examination + EC + stabilization care + 2 follow-up visits. (2)
= 1 + 18 + 4 + 2
= 25 visits.

Basic Frequency & Duration Program for Uncomplicated Axial Pain

For the Frequency and Duration of uncomplicated Axial Pain, we divide data from the above Equations #1 and #2 into visits per week and total weeks. If we add the initial examination and one of the follow-up examinations to the 18 visits in Equation #1, we obtain 20 visits. These 20 visits could be provided as:

A. 5 visits per week for 4 weeks
B. 4 visits per week for 5 weeks
C. 3 visits per week for 7 weeks

After one of these pain resolution programs in either item A, or B, or C above is provided to a patient, the 1 visit per week for 4 weeks of stabilization care is provided with an additional follow-up visit at the end of the stabilization 4 week block. Thus, the Frequency and Duration program of care for Uncomplicated Axial Pain is one of the following schedules of Chiropractic care, either:

ICA's Basic Frequency & Duration Program of Care #1

1.A. 5 visits per week for 4 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit (which is 25 visits in 8 weeks), or;
1.B. 4 visits per week for 5 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit (which is 25 visits in 9 weeks), or;
1.C. 3 visits per week for 7 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit (which is 25 visits in 11 weeks)

The above number of visits in specific time periods represents the, "Basic", ICA Frequency and Duration Program of Care. It was derived from published pain data from RCTs and thus, it is purely evidence-based. This Basic ICA Frequency and Duration Program of Care will be altered as complicating factors in the individual patient are confronted. Complicating factor situations are analyzed in the remainder of this document. Note 1A, 1B, and 1C are equivalent choices of ICA's Basic Frequency and Duration Care Program #1.

What if the patient becomes symptom free in a shorter than expected time?

If a patient achieves complete resolution of pain in less than 18 SMT visits, then he/she would be placed on stabilization care for 4 weeks and provided follow-up examinations. For example, if the patient was symptom free after only 3 SMT visits, then his/her program of care would be: 1 examination +3 SMT visits + 4 stabilization visits in 4 weeks + 2 follow-up examinations = 10 visits; after which, he/she would be released from care.

Is a Constant Linear Extrapolation of the number of visits justified?

It should be noted that the research designs of RCTs on SMT care have arbitrary visit limitations. Instead of having the care given to individual patients continue until Maximum Medical Improvement (MMI) has been reached, these researchers arbitrarily cut care (average approximately 8 visits) and collected pain data for the initial examination and the end of their arbitrary number of visits chosen. This arbitrary program of care (8.1 visits on average) creates an artificial impression of pain relief, when in fact only approximately just less than 45% improvement in VAS (or NRS) was attained. Since the designs of RCTs on SMT did not carry out care to MMI, no one knows exactly

what average amount of Chiropractic care would result in resolution of axial pain or create maximum pain improvement (MMI) in the subjects of these RCTs. Thus, one must extrapolate from the only data that is concretely available but completely inadequate for actual qualitative treatment recommendation (approximately 8.1 visits with 45% improvement in pain).

Because some chiropractors (such as college academics and paid consultants for 3rd party payers) may not be treating individual patients, they may neglect to consider the arbitrary 6-12 visit recommendation of many third party payers does not work in actual clinical practice when it comes to fully alleviating pain in the average patient with a simple case. This makes sense when one evaluates RCT pain data which suggests only less than 45% symptom improvement in 8.1 visits. Most agree patients should have the right to achieve pain resolution or to reach maximum medical improvement (MMI). It is the health care provider's obligation to render the best possible care based on current evidence and patients' unique individual presentation.

Additionally, some might believe restricting care authorization to 8.1 visits for those individuals, who are only at best 45% improved, is justified when compared to the increased cost of allowing 26-36 Chiropractic visits (18-28 additional). The average person, in 86 entries of NRS scores out of these 128 RCTs in Tables 1 and 2, has a beginning NRS score of 5.0 and an ending pain NRS score of 2.8. This change is only slightly above the 2-point change parameter on the NRS scale that represents a clinically meaningful improvement exceeding the bounds of mere potential measurement error.[150]

The average ending NRS score of 2.8 is nearly 3 [constant slight pain, starting to interfere with daily living tasks]. It is reasonable to conclude many of these patients, who only achieved 45% improvement and might be released from chiropractic care against their wishes because of financial or third party payor policy, would seek more expensive medical care for relief of their remaining symptoms. Ironically this likely reality increases the cost of patient care to both the individual patient and to third party payors as medical interventions have been shown to cost more than chiropractic ones.

Patients who receive continued chiropractic care utilize less of other, more expensive medical care.[151-154] Chiropractic represents an extremely small portion of Canadian and USA health care budgets, i.e., 0.275% in the USA.[155,156] Providing additional chiropractic care past 8.1 visits for these pain subjects will not negatively impact these national health care budgets.

We ask, how can an estimate of the needed additional care be determined? One possible method is our basic mathematical average, and thus, one must extrapolate from the only data that is available (approximately 8.1 visits with 45% improvement in pain).

The average values in our analysis were derived from a very large patient base of 6,730 subjects in a very large number of studies, i.e., 128 RCTs. This is exactly the type of mathematical data that can be justifiably extrapolated as purely evidence based. One means to support a constant linear extrapolation of this RCT pain data is to determine if this method over-estimates or under-estimates the care needed to reach MMI or reach resolution of pain symptoms. The data in Tables 1-5 show that our linear extrapolation under-estimates the number of visits needed to resolve simple low back pain, and thus, a constant linear extrapolation of visits is supported and is conservative.

Additionally, previous publications[148-149] analyzing the data in Tables 1 and 2, have shown a constant linear extrapolation of data in Equation 1 is actually very conservative and the correct number of visits needed to resolve average axial pain would, in reality, be higher. This analysis was derived from subgroup data. For example, if we exclude all the RCTs in Tables 1 and 2 that did not have chiropractors as the care givers, we derive Table 4. If we exclude all RCTs that provided 10 visits or less in Table 4, we derive Table 5. From Tables 3, 4 and 5, we will derive a graph of the actual "Dose-Response" of patients in these RCTs and compare this actual amount to our use of a constant linear extrapolation of visits.

Table 4
Uncomplicated Axial Pain RCTs with Treatment performed by DCs & with VAS/NRS data

Neck Pain , Upper Back pain, & Headaches RCTs	Type HA, NP, UBP	# Treated patients	# visits	Pain: NRS VAS/10 Pre/post	Treatment by DC, MD, DO, PT?
Beyerman et al, 2006	LBP	124	20	4.25 / 1.9	DC
Bronfort et al, 1996	Chronic LBP	122	10	5.4 / 3.7	DC
Cherkin et al, 1998	NR	133	6.9	5.5 / 2.0	DC
Gemmell et al, 1995	Acute LBP	30	1	4.74 / 2.54	DC
Giles et al, 1999	Chronic LBP	23	6	5.0 / 2.5	DC
Giles & Muller, 2003	Chronic LBP	32	18	5.0 / 2.5	DC
Gudavali et al, 2006	Chronic LBP	110	8-16	3.8 / 1.7	DC,PT
Haas et al, 2004	Chronic LBP	4G x 18 = 72	3,6,9,12	4.9 / 2.9	DC
Herzog et al, 1991	Chronic LBP	16	10	3.2 / 1.8	DC
Hoiriis et al, 2004	A,SA LBP	34	7	4.52 / 2.44	DC
Hsieh et al, 2002	Acute LBP	49	9	3.66/ 2.58	DC
Hurwitz et al, 2002	A, SA, C LBP	169	3.2	4.5 /2.5	DC
Santilli et al, 2006	Acute LBP	53	20	6.4 / 2.0	DC
Shearar et al, 2005	Chronic LBP	60	4	4.9 / 2.4	DC
Skargren et al, 1997,98	A, SA, C LBP	138	7	5.6 / 2.0	DC
Triano et al, 1995	Chronic LBP	47	12	3.8 / 1.3	DC
UK Beam Trial, 2004	SA,C LBP	353 + 333	17	6.07 / 4.09	DC,PT
Boline et al, 1995	Tension HA	70	12	2.8/2.15	DC
Bove, Nilsson, 1998	Tension HA	36	8	3.7/3.8	DC
Bronfort et al, 2001	Chronic NP	64	24	5.7 / 3.7	DC
Cassidy et al, 1992	Mechanical NP	100	1	3.4/2.1	DC
Donkin et al, 2002	Tension HA	30	9	4.27/1.93	DC
Evans et al, 2002	Chronic NP	101	20	5.6/2.65	DC
Giles & Muller, 1999	Chronic pain	23	6	4.5 / 1.5	DC
Giles & Muller, 2003	Chronic pain	25	18	6.0/3.0	DC
Haas et al, 2004	HA, Neck Pain	7, 8, 8	3, 9, 12	5.87/4.12 6.0/3.05 4.73/2.06	DC
Hurwitz et al, 2002	Neck Pain	171	1	4.8 / 2.6	DC
Jordan et al, 1998	Chronic NP	33	12	4.3 / 2.0	DC
Nelson et al, 1998	Migraine	106	14	4.7/4.2	DC
Nilsson, 1995	Chronic HA	20	6	4.7/2.7	DC
Nilsson, 1996-97	HA	28	6	4.4/2.8	DC
Palmgren et al, 2006	Chronic NP	18	3-5	5.12/2.22	DC
Parkin-Smith, 1998	Mechanical NP	30	6	3.35/1.52	DC
Parker et al, 1978	Migraine HA	30	7.5	4.9/2.8	DC
Skargren, 1997-98	NP & LBP	179	7	5.6 / 2.0	DC
Tuchin et al, 2000	Migraine HA	83	16	7.96/6.9	DC
van Schalkwyk 2000	Mechanical NP	30	10	3.58/1.35	DC
Wood et al, 2001	Neck Pain	30	8	5.03/2.11	DC
Yurkiw et al, 1996	Subacute NP	14	1	3.29/2.11	DC
Totals (# Patients, Mean Pre- & Post Pain & Mean Visits)		3,088	384.6/39= 9.9 mean	187.24/105.02 Mean= 44.% improved	39 RCTs by DCs with VAS/NRS

Table 5
RCTs from Table 4 with more than 10 visits

Neck Pain , Upper Back pain, & Headaches RCTs	Type HA, NP, UBP	# Treated patients	# visits	Pain: NRS VAS/10 Pre/post	Treatment by DC, MD, DO, PT?
Beyerman et al, 2006	LBP	124	20	4.25 / 1.9	DC
Giles & Muller, 2003	Chronic LBP	32	18	5.0 / 2.5	DC
Gudavali et al, 2006	Chronic LBP	110	8-16	3.8 / 1.7	DC,PT
Haas et al, 2004	Chronic LBP	18	12	4.9 / 2.9 ave	DC
Santilli et al, 2006	Acute LBP	53	20	6.4 / 2.0	DC
Triano et al, 1995	Chronic LBP	47	12	3.8 / 1.3	DC
UK Beam Trial,2004	SA,C LBP	353 + 333	17	6.07 / 4.09	DC,PT
Boline et al, 1995	Tension HA	70	12	2.8/2.15 ratio	DC
Bronfort et al, 2001	Chronic NP	64	24	5.7 / 3.7	DC
Evans et al, 2002	Chronic NP	101	20	5.6/2.65	DC
Giles & Muller, 2003	Chronic pain	25	18	NP : 6.0/3.0	DC
Haas et al, 2004	HA, Neck Pain	8	12	4.73/2.06	DC
Jordan et al, 1998	Chronic NP	33	12	4.3 / 2.0	DC
Nelson et al, 1998	Migraine	56,50	14	4.7/4.2	DC
Tuchin et al, 2000	Migraine HA	83	16	7.96/6.9	DC
van Schalkwyk 2000	Mechanical NP	15,15	10	3.58/1.35	DC
Totals (# Patients, Mean Pre- & Post Pain & Mean Visits)		1,590	249/16= 15.6 mean	89.92/49.11 Mean= 45.4% improved	16RCTs by DCs

From the data in Tables 3, 4, and 5, we can calculate a Dose-Response, which is defined as the percentage of average improvement in VAS divided by the number of average visits, for different programs of care (8.1 visits, 9.9 visits, and 15.6 visits). Table 6 provides this data and Figure 1 compares this data to a constant linear extrapolation. Note that the actual percent improvement per visit becomes less as the number of visits increase, which would indicate the necessity of more than a constant linear extrapolation of the number of treatments provided, i.e., constant linear extrapolation is conservative because it assumes treated problems resolve at a constant rate throughout the healing process when, in reality, this is likely not commonly reality.

Table 6
Dose-Response for RCTs with a different number of average visits provided to patients

	Average Visits	Average improvement in VAS	Dose-Response = % improvement VAS/mean visits
Table 3	8.1	45%	5.6% per visit
Table 4	9.9	44%	4.4% per visit
Table 5	15.6	45.4%	2.9% per visit

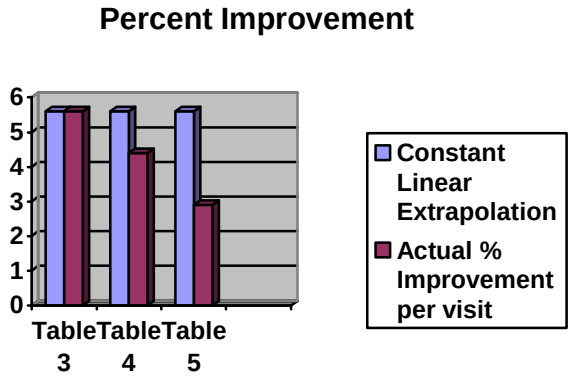

Figure 1. In the text, a constant linear extrapolation was used in Equation #1. However, the actual percent improvement per visit (Dose-Response) gets less as the number of visits increases, which would indicate the necessity of more than a constant linear extrapolation of the number of treatments provided, i.e., constant linear extrapolation is conservative.

II. Slowly recovering Patients with Axial Pain (Dose-Response)

From Table 6 and Figure 1, the Dose-Response got smaller as the number of visits provided to patients increased. This is because there is a subgroup of patients who recover much slower than others. When research designs of randomized clinical trials (RCT) restrict treatment visits to 10 or less, there is an artificially high level of improvement in reports of pain (approximately 45% improvement in VAS scores in 8 visits) due to the subgroup of patients who respond very quickly to spinal manipulative therapy (SMT) treatment, that is, patients who improve dramatically within 1-4 SMT visits.

Some have suggested that this quickly responding subgroup represents only those subjects who should receive SMT. We counter this by stating that, for example, a 3% improvement per visit in VAS score with SMT treatment is a clinically satisfying improvement over 30 visits (3%/visit x 30 visits = 90% improved in VAS) for the individuals receiving more care, which does not include the examination visits, 4 stabilization visits over 4 weeks, and the 2 follow-up visits (i.e., 30 +7 = 37 visits total in our example).

From the Outcomes Assessment Chapter, it is expected that the Chiropractor providing the care will keep up-to-date subjective, objective, functional, and structural records. These types of records will include part, but not all of the following: SOAP notes, pain scales, activity of daily living questionnaires, sEMG, range of motion, x-ray measures, posture measures, etc. to document the state

of improvement in all patients. This subjective and objective information will provide the data to support more than the 25 visits in 11 weeks (ICA's Basic Frequency & Duration #1C) when the individual patient, with uncomplicated mechanical axial pain, is not responding rapidly to Chiropractic care, but is responding favorably enough to justify continued treatment.

Thus, there must be allowances in the frequency and duration program outlined above for the subgroup of patients who are not yet normal after the first intensive program of 3 times per week for 7 weeks. Normal defined as NRS <1.0, range of motion, and activities of daily living are within normal limits. If one of the NRS pain score (> 1.0), or one of the health questionnaires scores, or objective outcome measures are below normal, but these subjective and objective measures show improvement after 7 weeks of intensive care, an additional 3 visits per week for 4 more weeks should be provided to these patients. This will allow them to achieve either resolution of their pain or to reach MMI.

The pains scores, objective outcome measures, and health questionnaires are repeated after each additional block of 4 weeks of intensive care at 3 visits per week. When the pain scores indicate normalcy (NRS < 1.0), objective outcome measures normalize, and the health questionnaire indicate normal values or the patient reaches MMI (as determined by no improvement after 2 extra blocks of 4 weeks of intensive care), the patient then enters the 4 weeks of stabilization care (1 visits per week for 4 weeks).

Therefore, modifying the ICA's basic Frequency and Duration Care Program, depending solely on the patient's objective improvements, the frequency and duration of care for slowly improving patients with uncomplicated Axial Pain would be:

For 1 extra block of 12 visit of care in 4 weeks

2.A. 5 visits per week for 4 weeks + 12 visits for 4 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 37 visits in 12 weeks), or;

2.B. 4 visits per week for 5 weeks + 12 visits for 4 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 37 visits in 13 weeks), or;

2.C. 3 visits per week for 7 weeks + 12 visits for 4 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 37 visits in 15 weeks).

For 2 extra blocks of 12 visit of care in 4 weeks (24 visits in 8 weeks)

3.A. 5 visits per week for 4 weeks + 24 visits for 8 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 49 visits in 16 weeks), or;

3.B. 4 visits per week for 5 weeks + 24 visits for 8 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 49 visits in 17 weeks), or;

3.C. 3 visits per week for 7 weeks + 24 visits for 8 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 49 visits in 19 weeks)

It is noted that there is good evidence for Frequency and Duration Care Program #2 from several Level 2 publications (non-randomized clinical trials), which reported 75% improvement in chronic axial pain in 36 visits in 12 weeks.[157-161]

Again note that Programs 2A, 2B, and 2C are equivalent, while the same is true for 3A, 3B, and 3C, which are equivalent. These ICA Frequency and Duration Care Programs (items #1-#3) are evidence-based and are solely dependent on published data and objective patient improvements. However, some 3rd party payers may object to these ICA Guidelines being outside the limits of their policies provided to their insured. The ICA cannot, and should not, modify evidence-based protocols based on the desires of stakeholders with financial conflicts of interest. Therefore, to achieve resolution of their symptoms and/or reach MMI, patients may have to personally pay for care past what is covered by their insurance company. Additionally, Government agencies (e.g., State Chiropractic Boards of Examiners) are hereby notified of the long-term care programs that may be necessary in some individuals with Uncomplicated Axial Pain.

Next, we turn our attention to patients, who have Complicated Axial Pain, which will require a modification of the ICA's Basic Frequency and Duration Care Program #1.

III. Axial Pain with Complicating Factors

Any complicating factors in a patient with Axial Pain will require a modification in the ICA's Basic Frequency and Duration Program of Care #1.

When complicating factors are present, then the patient cannot be considered to have the easy, simple, uncomplicated, mechanical axial pain, and thus, the ICA's Basic Frequency and Duration Care Program (items #1A, 1B, or 1C) discussed above will not be sufficient to resolve the patients' conditions. Table 7 provides a list of complicating factors, which are not limited to this list, that may affect the frequency and duration of chiropractic care required to resolve the patients' conditions or to reach MMI.

Table 7
The patient may present with pain, but with some of the complications listed below. Complicating factors may include these conditions, but are not limited to these.

1. <5 yrs at same employer
2. Abnormal joint motion
3. Abnormal Posture
4. Absolute cervical spinal canal stenosis (10-12 mm)
5. Advanced age
6. Asymmetry of muscle tone
7. Cervical Kyphosis
8. Compression fracture
9. Condition chronicity
10. Congenital fused cervical segments
11. Dens fracture
12. Emotional stress
13. Employment satisfaction
14. Ergonomic factors
15. Expectations of recovery
16. Facet fracture
17. Falling as a mechanism of prior injury
18. Family/relationship stress
19. Fixated segment on flexion/extension films
20. Increased spine flexibility
21. Laterolisthesis
22. Leg length inequality
23. Leg pain greater than back pain
24. Level of fitness
25. Likely mechanical tissue damage
26. Loss of cervical lordosis
27. Loss of consciousness after trauma
28. Lower wage employment
29. Lumbar Kyphosis
30. Managing Named Diseases (eg., MS, Chrones Disease, Asthma, etc)
31. NRS $\geq$ 7.0
32. Obesity
33. One-sided sports/exercise activity
34. Osteoarthritis
35. Pain with radicular signs/symptoms
36. Physical limitations (can't exercise, can't walk, wheelchair, etc)
37. poor body mechanics
38. Poor spinal motor control
39. Pre-existing degenerative joint disease
40. Prior recent injury (<6 mos.)
41. Prior surgery in area of complaint
42. Prolonged static postures
43. Reduced muscle endurance
44. Relative cervical spinal canal stenosis (13-15 mm)
45. Retrolisthesis
46. Rheumatoid arthritis
47. Scoliosis (define: 10º or more?)
48. Smoking
49. Spinal Anomaly
50. Spondylolisthesis/spondylolysis
51. Surgically fused cervical segments
52. Sustained (frequent/continuous) trunk load > 20 lbs.
53. Traumatic causation
54. Wearing high heel shoes
55. Work-related duties

When complicating factors are present in individuals with Axial Pain, the ICA Frequency and Duration Care Programs #2 or #3 will be recommended. The determination of which exact Program of

Care will be most appropriate will depend on the follow-up examinations, during which, pain scales, range of motion, and activities of daily living are assessed. If NRS > 1.0 and/or range of motion is still below normal limits and/or activities of daily living are still restricted, then an additional block of care consisting of 3 visits per week for 4 more weeks should be provided to these patients. Therefore, depending on the complicating factors, it might be necessary to provide 1, 2, 3, 4 or even 5 extra blocks of care consisting of 3 visits per week for 4 more weeks:

For 3 extra blocks of 12 visit of care in 4 weeks (36 visits in 12 weeks)

4.A. 5 visits per week for 4 weeks + 36 visits for 12 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 61 visits in 20 weeks), or;

4.B. 4 visits per week for 5 weeks + 36 visits for 12 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 61 visits in 21 weeks), or;

4.C. 3 visits per week for 7 weeks + 36 visits for 12 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 61 visits in 23 weeks).

For 4 extra blocks of 12 visit of care in 4 weeks (48 visits in 16 weeks)

5.A. 5 visits per week for 4 weeks + 48 visits for 16 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 73 visits in 24 weeks), or;

5.B. 4 visits per week for 5 weeks + 48 visits for 16 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 73 visits in 25 weeks), or;

5.C. 3 visits per week for 7 weeks + 48 visits for 16 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 73 visits in 27 weeks)

For 5 extra blocks of 12 visit of care in 4 weeks (60 visits in 20 weeks)

6.A. 5 visits per week for 4 weeks + 60 visits for 20 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 85 visits in 28 weeks), or;

6.B. 4 visits per week for 5 weeks + 60 visits for 20 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 85 visits in 28 weeks), or;

6.C. 3 visits per week for 7 weeks + 60 visits for 20 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit; (which is 85 visits in 31 weeks)

Again we remind the reader that Care Programs 4A, 4B, and 4C are equivalent, as are 5A, 5B, and 5C, and 6A, 6B, and 6C are equivalent.

At this point, we must remind the reader that there is no reliable way to predict which of the ICA's Frequency and Duration Care Programs (#1-#6) will be necessary in any one individual case when complicating factors are present. The determination of which program of care, #1-#6, will be necessary, is solely dependent upon the individual's progress at the follow-up examinations.

For an example of the existing support for ICA Program of Care #5, for injured discs, the very conservative Official Disability Guidelines (ODG) from Work Loss Data Institute (www.disabilitydurations.com) states that for the chiropractic code 98940 for diagnosis 722.10, one should require an average of 53.3 treatments. For an example of support for ICA's Program of Care #1, from ODG, with chiropractic code 98940 for diagnosis 847.2, one gets an average of 21.03 treatments. Another example from ODG, ICA's Program of Care #2 is supported for carpal tunnel; one should require an average of 31.35 treatments for Chiropractic care.

IV. Headaches

While headaches were included in the data in Table 2, we have included these symptoms separately here due to the fact that RCTs with SMT treatment for headache conditions show a slower dose-response compared to the other Axial Pain regions. Table 8 provides the data to support our statement. From Table 8, we derive the constant linear extrapolation of visits for headaches.

Estimated Care (**EC**) = (average visit)(100%)/(% of average improvement)
= (8.75)(100%)/(38.2%)
≈ 23 visits.

Using the initial examination visit, 4 once per week stabilization visits, and two follow-up visits in Equation #2, we have 30 visits needed to examine, treat, stabilize, document, and follow-up on patients with headaches, neck pain, cervico-brachial pain, and/or upper back pain:

Total Visits = 1 examination visit + EC + stabilization care + 2 follow-up visits.
= 1+ 23 + 4 + 2
= 30 visits.

Table 8
RCTs with SMT treatment for Headaches

Headaches RCTs	Type HA, NP, UBP	# Treated patients	# visits	Pain: NRS VAS/10 Pre/post	Treatment by DC, MD, DO, PT?
Boline et al, 1995[20]	Tension HA	70	12	2.8/2.15 ratio	DC
Bove, Nilsson, 1998[21]	Tension HA	36	8	3.7/3.8	DC
Donkin et al, 2002[30]	Tension HA	15,15	9	4.03/1.47 & 4.5/2.39	DC
Haas et al, 2004[34]	HA, Neck Pain	7, 8, 8	3, 9, 12	HA :5.14/4.05 HA: 6.12/3.13 HA: 4.5/1.87	DC
Hemmilia et al, 2005[35]	HA,NP,UBP	22	5	5.06/1.85	Bone Setter
Hoyt et al, 1979[39]	Tension HA	10	1	5.4/2.9 ratio	DO
Jensen et al, 1990[42]	Post-trauma HA	10	2	2.1/1.6	MD
Jull et al, 2002[44]	Cervico-genic HA	49,51,51	8-12	5.1/1.8	PT
Nelson et al, 1998[51]	Migraine	56,50	14	4.7/4.2	DC
Nilsson, 1995[52]	Chronic HA	20	6	4.7/2.7	DC
Nilsson, 1996-97[53,54]	HA	28	6	4.4/2.8	DC
Parker et al, 1978[58]	Migraine HA	30	7.5	4.9/2.8	DC
Tuchin et al, 2000[64]	Migraine HA	83	16	7.96/6.9	DC
Whittingham et al, 2001[67]	Cervicogenic HA	49 55	9 9	NR	DC
Totals (# Patients, Mean Pre- & Post Pain & Mean Visits)		723	122.5/14 = 8.75 mean	75.11/46.41 Mean= 38.2% improved	10 RCTs by DCs

Thus we note that Table 8, Equation #1, and Equation #2 indicate, on average, headaches take 5 visits longer to resolve than cervical pain, cervicobrachial pain, upper back pain, and/or low back pain. Additionally, if the uncomplicated headache patient responses slowly, then ICA's Frequency and Duration Care Programs #2 or #3 may be needed to resolve the patient's condition or to reach MMI, but with 5 extra visits.

As stated above, complicating factors will increase the number of visits required to resolve the patient's condition or to reach MMI. Thus, ICA's Frequency and Duration Care Programs #4 or #5 or #6 may be needed in complicated headache cases. The determination of which Frequency and Duration Care Program will be needed is solely based on the pain scale score, range of motion, x-ray measurements, posture, and activities of daily living at each follow-up examination. It cannot be stressed enough that Guidelines are suggestions, which must be altered for individual patients who respond differently than the norm.

V. Geriatrics: USA Medicare Laws as a Standard

Many Chiropractors believe that Medicare already "caps" Chiropractic visits at a Frequency and Duration of Care at 12 or 15 visits in 4 to 5 weeks, or some other unpublished arbitrary number. However this is not the truth. These caps vary by state/carrier and are called "soft caps".

Presently, Medicare has no hard cap for Chiropractic Frequency and Duration. A Medicare patient who has been seeing a chiropractor for say 12 visits and has a new injury or an exacerbation of a chronic condition is entitled to further treatment under Medicare policy, as long as the medical necessity has been properly documented and communicated to Medicare. Should a Medicare recipient have multiple exacerbations/new injuries coverage for chiropractic care could conceivably continue ad infinitum. This policy is a benefit not only to the Medicare recipient who cannot "exhaust" their chiropractic benefits, but also to the government by not leaving the patient to have to resort to more expensive medical treatment for their conditions.

However, after reading the notorious *Chiropractic Services in the Medicare Program: Payment Vulnerability Analysis*, issued June 21, 2005 by the Office of the Inspector General (OIG) of the US Department of Health and Human Services (HHS),[162] the Frequency and duration for Chiropractic under Medicare may change soon. The findings of the investigation[162] essentially led to a recommendation of a national hard cap on chiropractic treatment under Medicare.

Anyone who knows anything about Medicare and chiropractic knows that the lack of an official "hard cap" is a great policy. However, on page 14 of this 38 page document, the OIG author states, *"The American Chiropractic Association expressed support for a national cap in an October 21, 1999, letter to the Director of the Office of Clinical Standards and Quality at the Health Care Financing Administration (currently CMS). Based on the recommendations of a representative panel of chiropractors, the letter states that '[a threshold of 18 services] reflects the consensus of the chiropractic profession' and is clinically relevant."* [162]

This suggestion is not based on any data. Compare this suggestion with the ICA Basic Frequency and Duration Program of Care #1, which is evidence-based from RCT pain data and suggests 25 visits initially. Recall that ICA Program #1A provided 25 visits in 8 weeks, #1B provided 25 visits in 9 weeks, and #1C provided 25 visits in 11 weeks. A primary purpose of this ICA document is to provide all relevant research data to stakeholders, which includes CMS, allowing them an opportunity to fully understand, communicate, and apply evidence based care.

Recent publications have identified complicating factors in Seniors with chronic low back pain.[163-167] Chronic low back pain (CLBP) is one of the most disabling and therapeutically challenging pain conditions afflicting older adults.[163] Rudy et al.[163] found that eight measures uniquely maximized the separation between Seniors with chronic pain and those without pain:

(a) self-reported function with the Functional Status Index,
(b) the SF-36,
(c) performance based function with repetitive trunk rotation,
(d) functional reach,
(e) mood with the Geriatric Depression Scale,
(f) co-morbidity with the Cumulative Illness Rating Scale,
(g) body mass index (BMI), and

(h) severity of degenerative disc disease.

However, we note, that in general, Medicare aged patients have numerous complications (refer back to Table 7) due to chronic pain, spinal degeneration, co-morbidity, and various traumas accumulated in their lifetimes. Thus, generally, Medicare patients, with pain, will have several of the complicating factors in Table 7 and will need more than the initial ICA Program of Care #1 to resolve their pain or reach MMI.

In the ICA Best Practices data base, for Geriatric patient published studies, there are more than 24 RCTs (Level 1), 1 Level 2 study, 5 level 3 studies, and 107 Level 4 studies.[168-304] See Tables 9-12. As we noted previously, RCTs arbitrarily limit care in their research designs (i.e., cut visits) instead of carrying out care to MMI. Thus, it is noted that the RCTs and non-randomized clinical trials will only arrive at a percentage of pain improvement, which is often 50% or less.

However, it is important to note here that competing guidelines and a recent publication[305,306] claimed that there were no published RCTs supporting Chiropractic care of Seniors (Geriatrics). In Tables 9-12, some of the RCTs and Levels 2-4 evidence on Seniors with SMT/Mobilization as the treatment are presented.

Table 9
Level 1 Geriatric Studies from the ICA Best Practices Data Base

Author	Points	Treatments	Weeks	Positive Outcome?
Bakris, George L MD; 2007	18	1	1	Yes
Blunt, Kelli L DC; 1997	16	12	4	Yes
Boline, PD; 1995	15	12	6	Yes
Erhard, Richard E., PT; 1994	15	3	1	Yes
Farrell, Joseph P. PT; 1982	15	9	3	Yes
Ferreira, Manuela L; 2007	17	12	8	Yes
Gemmell, Hugh A; 1992	15	8	4	Yes
Hoving, Jan L PT PhD; 2002	18	6	6	Yes
Hurwitz, Eric L. DC PhD; 2002	18	1		Yes
Kessinger R; 1998	16	7	6	Yes
Licciardone, John C DO; 2003	20			Yes
MacDonald, Roderic, S MB, BS; 1990	15	5	12	Yes
Meade, T W; 1990	19	10	12	Yes
Nelson, Craig F DC MS; 1998	18	16	8	Yes
Ongley; 1987	18			Yes
Rupert, Ronald L. MS, DC; 1985	17	8	4	Yes
Santilli, Valter, MD; 2006	17	20	4	Yes
Saunders, Stephen E DC; 2003	13	1	1	Yes
Sims-Williams, H MB CHB; 1978	17	14	4	Yes
Skargren, EI; 1997	17	4		Yes
Stakes, Neil Osmond; 2006	11	6	4	Yes
Tuchin, Peter J GRADDIPCHIRO; 2000	16		8	Yes
Williams, Nefyn H; 2003	16	24	8	Yes
Zylbergold, Ruth S BSC, PT; 1981	15			Yes
Averages:	**16**	**10 visits**	**5 weeks**	

Table 10
Level 2 Geriatric Studies from the ICA Best Practices Data Base

Author	Points	Treatments	Weeks	Positive Outcome?
Saunders, Stephen E DC; 2003	13	1	1	Yes

Table 11
Level 3 Geriatric Studies from the ICA Best Practices Data Base

Author	Points	Treatments	Weeks	Positive Outcome?
Brantingham, James W DC; 2003	14	6	3	Yes
Cagle, Peter L BGS, DC; 1995	11	13		Yes
Connolly, Robert E DC; 1991	12		12	Yes
Knutson, Gary A DC; 1997	9	1		Yes
Senstad, Ola DC; 1997	14	6		Yes
Averages	12	6.5 visits	7.5 weeks	

Table 12
Level 4 Geriatric Studies from the ICA Best Practices Data Base

Author	Points	Treatments	Weeks	Positive Outcome?
Anglen RL; 1998	11			Yes
Barvinchack, John DC; 1973	11		16	Yes
Beal, Myron C DO; 1989	13			Yes
Bedner, Eugene R DC, DACRB; 1997	10	13	12	Yes
Bergin J, ; 1995	8			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes

Table 12 Continued…

Author	Points	Treatments	Weeks	*Positive Outcome?*
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanchard, M DC; 1950**	12			Yes
Blanks, Robert H. I., Ph.D; 1997	14		154.8	Yes
Bryant, Tim C; 1988	9			Yes
Connelly DM; 1998	10	16	21.5	Yes
Cox, James M DC; 2005	12		6	Yes
Crawford, Colin M; 1995	9		6	Yes
Cuthbert, Scott C; 2006	12			Yes
David, J ; 1998	12	6	6	Yes
Diamond, Michael R DC; 1994	8	3	6	Yes
Diduro, Joseph O; 2006	10	1	1	Yes
Dupriest, Michael C DC; 1993	12	12	3	Yes
Elster, Erin L DC; 2004	11		158	Yes
Elster, Erin L.; 2003	12	6	12	Yes
Gemmell, Hugh A; 1994	12	8	26	Yes
Gleberzon, B ; 2005	10	27	16	Yes
Gleberzon, B.; 2005**	11	12	6	Yes
Haas, Jason W MD; 2004	12	36	12	Yes
Haselden, P; 2006	10		8	Yes
Hildebrandt, Rw ; 1973	6			Yes
Hildebrandt, Rw ; 1973**	8			Yes
Hildebrandt, Rw ; 1973**	7			Yes

Table 12 Continued…

Author	Points	Treatments	Weeks	*Positive Outcome?*
Hildebrandt, Rw ; 1973**	8			Yes
Hildebrandt, Rw ; 1973**	9			Yes
Hildebrandt, Rw ; 1973**	8			Yes
Howard, Paul D.; 2007	12	4	2.5	Yes
Johnson I.; 2001	8			Yes
Kadel, Roy E DC; 1982	15	15	5	Yes
Kaufman, RL; 1997	10	1	6	Yes
Kaur, Rashpal, A.; 2004	12	6		Yes
Kesinger, Jack; 1989	12	37	52	Yes
Kessinger J; 1995	13	54	52	Yes
Kessinger, RC; 2000	11	3	14	Yes
MacDonald, Cameron W; 2006	14			Yes
McCoy, Harold G; 1997	10		29	Yes
Meyer, Donald W; 1999	8	14	9	Yes
Meyer, Donald W.; 2002	9	16	8	Yes
Middleton, Joanne; 2005	11	10	5	Yes
Miller, Brenda; 1984	10	13	12	Yes
Morningstar, Mark W DC; 2006	11	24	12	Yes
Morter, Ted; 1998	10		0.57	Yes
Murphy, Donald R DC; 2006	12	12	4	Yes
Polkinghorn BS. ; 1995	11	12	6	Yes
Pope, Michael DC; 1994	13	24	12	Yes
Rossi, Paolo MD; 2006	10			Yes
Rowell, R; 2006	9	11	11	Yes
Schimp, David J DC; 1992	8	6	2	Yes
Schmidt, Margaret J DC; 1946	7			Yes
Simpson, Sue; 2006	12	13	6	Yes
Snow, Gregory J D.C.; 2001	8	9	24	Yes
Taylor, David N; 2007	10		21.5	Yes
van der Velde, Gabrielle M.; 1999	11	3	6	Yes
Vickery, Brice E DC; 1999	7			Yes
Weiant, BW PhD DC; 1946	6			Yes
Williams BD DC; 1994	11			Yes
Williams, Sid E DC; 1989	6	10		Yes
Averages	11	15 visits	20 weeks	

***** ie.*** *Blanchard, M DC; 1950: Each listing represents a separate case study published in this document.*

VI. Motor Vehicle Accidents

For this section on Frequency and Duration Programs of Care concerning traumas during Motor Vehicle Accidents (MVA), it is important to realize that there are many different directions of impact that will affect the postural movements of the head and neck during the car crash and thereby dictate which head and/or spinal structures will be injured.[307-318] Some of these directions of impact would be (a) rear-end, (b) head-on, (c) side impact, (d) 45º oblique from the rear, and (e) 45º oblique from the front. Obviously we could pick any angle other than 45º in the oblique range. In general, rear-end collisions create a sagittal "S"-curve in the neck (kyphotic-lordotic) with shear on the discs and facets; front impacts create the opposite sagittal "S"-shape (lordotic-kyphotic) in the neck combined with head-neck flexion (unless the head strikes an object before the flexion occurs); while side impacts create a lateral translation "S"-shape.[319-321]

Much has been written on rear-end collisions to the somewhat neglect of the other directions of impact. For an example, a PubMed Search in January 2008 with, "whiplash", will retrieve 2,476 citations. It has been reported that 15.5 million Americans have chronic pain from whiplash accidents. However, it is becoming increasingly obvious that research on chronic pain is being funded by insurance companies and thus enormous bias is probable.[322] Some have coined the words, "Whiplash-Associated Disorders", (WAD) for the injuries sustained by victims in rear-end collisions, while others have coined the words, "Cervical Acceleration-Deceleration", (CAD) to describe the movement of the head in the group of patient sustaining rear-end or front-end collisions.

There is surprisingly little written about the duration and frequency of treatment for whiplash injuries. Individual authors have published their recommendations based upon personal experience, and only a few good studies have been published primarily on the duration of treatment.[323-331] This published information has appeared over a span of nearly 50 years, displaying similarities and trends that are reviewed below in Table 13.

Table 13
Some of the few Historical papers that Report Frequency and Duration for Whiplash Victims.[323-331]

Year	Author	Duration	Frequency
1953	Billig	Several Months	3X/day, Then 3X/wk
1958	Seletz	N/A	Start Early, Daily 2-3 wks, Then 3X/wk
1978	Jackson	N/A	Daily 1-2 wks, Then 3X/wk
1986	Ameis	Mild: up to 6 mo Mod: 6mo-3 yrs	NR
1990	Gargan	2 yrs	NR
1992	Mercy Document	Uncomplicated: 16 wks Complicated: 24 –32 wks	Daily for 2 wks, Then 3X/wk for 4 wks, Then 2X/wk for 10 wks = 42 visits 1.5 or 2X the uncomplicated frequency
1994	Schofferman	2 mo – 2 yr 1 mo Mean: 7mo 1 wk	NR
1994	Barnsley	3 mo – 2 yrs	NR
2005	Tomlinson	3 mo – 2 yrs	NR

Perhaps the greatest amount of work concerning the frequency and duration for treatment of whiplash injuries has been done by Foreman and Croft.[332-334] Since there is so much published material on MVA victims, injuries, mechanism of injury, etc., it is difficult to determine a Frequency and Duration Program of Care. One might think to use the information provided by the Quebec Task Force on WAD,[335] however, this text and document were found to have many methodological errors.[334,336]

For example, this Quebec WAD Task Force study was designed to determine retrospectively the natural history of whiplash injuries. However, recovery from whiplash injuries was determined by the discontinuation of payments and not by the resolution of symptoms! Patients complaining of, 'recurrences', who comprised a substantial percentage of the total number of patients studied, were specifically excluded from the data set. When these patients were included in the data set, the percentage of patients who failed to recover (based on whether they were still receiving compensation) had risen from the reported 2.9% to as high as 12.4% after one year. It is impossible to draw valid conclusions about the natural history of whiplash injuries from this study because it did not study recovery from whiplash symptoms and excluded the majority of patients who were classified as, 'recurrences', from the final study analysis.[336] Although the Quebec Task Force on WAD had many methodological errors, it took many examples of its terminology from Croft's texts.[333]

Because of the above mentioned ideas, we decided to use the long established Croft CAD Guidelines for our basic Frequency and Duration Programs of Care for MVA victims.

When developing his guidelines, Croft incorporated the stages of tissue repair. Since cervical spine tissues are injured in MVAs, this is a logical foundation. Depending on the injury site and how many spinal tissues are injured in a MVA, there will alterations in the time of repair after a cervical spine injury. While there are reports of many tissues injured in MVAs, Bogduk has reported that approximately 50% of the cervical pain comes from injured facets and 25% comes from injured cervical discs. The stages of injury repair are defined in Table 14. In MVAs, Croft originated 5 grades of injury during CAD and these Grades have been universally accepted in the literature (Table 15).[333]

Table 14
Repair Time and Stages of Repair

Stage	Stage Description	Healing Time
I	acute inflammatory stage	0 - 72 hours;
II	repair stage	72 hours - 14 weeks;
III	remodeling stage	14 weeks - 12 months or more
IV	chronic; permanent	

Table 15
Croft's Grades of Injury[333]

Grades	Severity	Anatomical and Clinical Description
I	minimal	no limitation of range of motion, no ligamentous injury, no neurological symptoms
II	slight	limitation of range of motion, no ligamentous injury, no neurological findings
III	moderate	limitation of range of motion, some ligamentous injury, neurological findings present
IV	moderate to severe	limitation of range of motion, ligamentous instability, neurological findings present, fracture or disc derangement
V	severe	requires surgical treatment and stabilization.

Croft Frequency and Duration Table

The table below details the Croft treatment recommendations. In the 7th and 8th right hand columns are the approximate maximum treatment duration and the approximate maximum number of visits expected to be necessary over that period. In the last column, we correlate Croft's Frequency and Duration schedules with the ICA's 6 Programs of Care. Croft stated that patients, not at high risk for poor outcome, should not require treatment approaching these maxima. This guideline is based on Croft's analysis of approximately 2,000 randomly selected cases from a number of treating practitioners' files (Table 16).

Table 16
Croft's Frequency & Duration Table for the Different Grades of MVA Injury[333]

Grade	Daily	3x/wk	2x/wk	1x/wk	1x/mo	Duration	# visits	ICA Equivalent
Grade I	1 wk	1-2 wk	2-3 wk	> 4 wk	----*	> 10 wk	> 21	**#1C**
Grade II	1 wk	> 4 wk	> 4 wk	> 4 wk	> 4 mo	> 29 wk	> 33	**#2C**
Grade III	1-2 wk	> 10 wk	> 10 wk	> 10 wk	> 6 mo	> 56 wk	> 76	**#6C**
Grade IV	2-3 wk	> 16 wk	> 12 wk	> 20 wk	**	**	**	
Grade V	Surgical stabilization necessary - chiropractic care is post surgical							

**may require permanent monthly or permanent palliative care

Supporting Evidence for Grades I, II, and III

The Insurance Research Council (IRC) reported that the average number of treatments provided by DCs in cases of CAD trauma was 32.[337] Considering that most CAD injuries requiring treatment will be graded either Grade I, II, or III, this serves to validate the guidelines to some degree.[194] This 32 visit average is close to Croft's Grade II recommendation and ICA's Program of Care #2C. Another study found that the mean visits with trauma (including MVAs) was 34.7.[338]

Additionally, these Croft CAD Guidelines have been adopted by 11 states and the ICA: Alaska, Arkansas, Colorado, Kentucky, Minnesota, North Carolina, Ohio, Oklahoma, Oregon, South Dakota, Washington and the International Chiropractic Association.

While not fitting exactly, we have determined an ICA Program Equivalent to Croft's Frequency and Duration schedules for Grade I, Grade II, and Grade III. The major difference is that Croft recommends long durations for one visit per week and one visit per month. His recommendations seem quite logical in that MVA victims have ongoing symptoms for months or years in some cases.

Just like our extended programs when complicating factors are present (review Table 7), Croft provided several complicating factors that might influence the Frequency and Duration of care to be a maximum. We note that most of Croft's complicating factors for CAD victims are included in our ICA Table 7. These Croft complicating factors are listed in Table 17.

In Canada for WAD Grades I and II, the Financial Services Commission of Ontario has pre-approved framework (PAF) Guidelines which allow 9 visits for the acute phase and 10 visits for the subacute phase.[339]

Table 17
Croft's List of Complicating Factors

1. Advance Age
2. Disc protrusion/herniation
3. Prior vertebral facture
4. Metabolic disorders
5. Spondylosis and/or facet arthrosis
6. Osteoporosis or bone disease
7. Congenital anomalies of the spine
8. Arthritis of the spine Spinal or foraminal stenosis
9. Development anomalies of the spine
10. AS or other spondylarthropathy
11. Paraplegia/tetraplegia
12. Degenerative disc disease
13. Prior cervical or lumbar spine surgery
14. Prior spinal injury; scoliosis

Open-ended Frequency & Duration for Grade IV Subjects

ICA will adopt/adapt the Croft Guidelines for Frequency and Duration of Care for subjects with injury Grades I, II, and III (see Table 12). However, because of the open-ended extended Frequency and Duration program recommended by Croft for Grade IV CAD injured subjects, ICA has formulated a Program of Care #7 for these Grade IV subjects:

For 6 extra blocks of 12 visits of care in each 4 week period (72 visits in 24 weeks) + 20 weeks at 1 visit per week +12 months at 1 visit per month

7.A. 5 visits per week for 4 weeks + 72 visits for 24 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit after each 4 week block + 20 visits in 20 weeks + 12 visits in 12 months; (which is 142 visits in 2 years), or;

7.B. 4 visits per week for 5 weeks + 72 visits for 24 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit after each 4 week block + 20 visits in 20 weeks + 12 visits in 12 months; (which is 142 visits in 2 years), or;

7.C. 3 visits per week for 7 weeks + 72 visits for 24 weeks + 1 visit per week for 4 weeks + 1 follow-up exam visit after each 4 week block + 20 visits in 20 weeks + 12 visits in 12 months; (which is 142 visits in 2 years).

Note, for Grade IV subjects, an evaluation including numerical pain scale, range of motion, x-ray, and activities of daily living (such as SF36) should be performed periodically (such as every 3 months) in order to document the patient's condition and the need for ongoing open-ended care.

VII. Trauma Patients: Workers Compensation

In most comparisons to USA State Workers Compensation Programs of Care, the Canadian Ontario Workplace Safety & Insurance Board (WSIB) Program of Care is more fair and equitable for all health care professionals in general, and for Chiropractic in particular.[340] The WSIB Program of Care for injured workers with acute and subacute low back injuries includes 12 weeks of care with up to 5 sessions per week decreasing as the patient recovers.[340] SMT is recommended and a 36 visit total in 12 weeks is considered reasonable (eg., 5 visits per week for 2 weeks, 4 visits per week for 2 weeks, 3 visits per week for 4 weeks, 2 visits per week for 2 weeks, and 1 visit per week for 2 weeks = 36 visits in 12 weeks). This is equivalent to ICA's Frequency and Duration Program of Care #2.

While it would require too much space to summarize Workers Compensation Frequency and Duration Programs from every State in the USA, we will present a few representative States. It is noted, in general, these USA State Workers Compensation Frequencies and Durations for Chiropractic Care are arbitrary and unnecessarily reduced compared to (a) State Programs approved for Physical Therapists, Occupational Therapists, and Doctors of Osteopathy, (b) Ontario's WSIB Program of Care, and (c) ICA's Programs of Care #1 and #2.

While most States (e.g., Massachusetts) restrict the number of modalities, that are ancillary or preparatory to the adjustments, that can be billed during any one visit by a DC, some States (e.g., Washington) do not allow chiropractors to get reimbursed for modalities.

While a few States have nearly identical Workers Compensation guidelines for chiropractors, most States have quite different Guidelines.

Some States (e.g., California) have adopted either the ODG or ACOEM Guidelines[11,13,18] that are quite restrictive for Chiropractic care, and additionally, these Guidelines are sold by companies (e.g., Work Loss Data Institute), which are owned by chiropractic competitors, i.e., medical doctors. The Work Loss Data Institute (WLDI), which sells guidelines to third party payers, has a 6-12 visit

frequency and duration limit for chiropractic care. From WLDI's *Official Disability Guidelines* 11th edition web site:

> **"**Chiropractic Guidelines: Therapeutic care --
> Mild: 6 visits over 2 weeks
> Severe: Trial of 6 visits over 2 weeks
> Severe: With evidence of objective functional improvement, total of up to 18 visits (12 additional) over 6-8 weeks,
> Elective care -- As needed."[341]

Recently, some other practice guidelines, insurance companies, and managed care organizations (MCO) have been restricting chiropractic care to 6-12 visits.[11,13,14,18,341] For instance, the recent 2004 Occupational Medicine Practice Guidelines (ACOEM), which are being used by third parties across the United States to direct chiropractic care and are legislatively mandated in California workers' compensation, restricts chiropractic care to 6-12 visits in 4 weeks duration.[13]

Clearly these 6-12 visit limits in 4 weeks for chiropractic care are arbitrary, personal opinion, and are without an evidence base.

In contrast, the ICA's Frequency and Duration Program of Care #1 derived earlier in this chapter from pain data reported in 128 RCTs on uncomplicated axial pain is Evidence-Based and suggests an average of 25 chiropractic visits in 8-11 weeks.

Commonality of State Workers Compensation Guidelines

Most State Workers Compensation (WC) Guidelines allow for extended durations of care beyond what is considered "maximum" in cases of re-injury, interrupted continuity of care, exacerbation of symptoms, and in patients with co-morbidities. There was a common time to produce an effect, which were 1-6 visits. Most States define, "Chronic pain disorders", as scoliosis, apparent leg length inequality, pelvic imbalance, facet restriction, sacroiliac dysfunction, myofascial dysfunction, gait disturbances, or postural dysfunction.

Activities of daily living or repetitive postural stresses are likely to cause a flare up requiring additional sessions.

Most State WC Guidelines state that their recommendations are only estimates of treatment and healing time, and can be modified by patient improvement or lack of improvement, which information should be supported by subjective and objective follow-up documentation. They state their guidelines are for neuromusculoskeletal (NMS) conditions only.

The State Boards of Oregon and North Carolina[342-343] list definitions and treatment durations (Table 18) and some complicating factors (similar to ICA's table 7 and Croft's Table 12) that may extend the Frequency and Duration of Chiropractic Care. Table 19 lists some of these complicating factors. Additionally, the State Boards of Oregon and North Carolina define some types of care that are relevant to Chiropractors, see Table 20.

Previously for Workers Compensation sessions, Oregon Chiropractors were only allowed 12 visits in 30 days before the patient had to be evaluated by an MD. As of January 1, 2008, in Oregon for Chiropractic care, the State Workers Compensation Division has allowed, "for a cumulative total of 60 days from the first visit on the initial claim or for a cumulative total of 18 visits, whichever occurs first, to any of the medical service providers listed in this paragraph".[344] This would be equivalent to 3 visits per week for 4 weeks (12 visits) plus 2 visits per week for 2 weeks (4 visits) plus 1 visits per week for 2 weeks (2 visits).

Table 18
Definitions and Durations from State Boards in Oregon and NorthCarolina[342,343]

Category	Condition	Duration: # weeks
I	1. Acute Facet Syndrome, 2. Acute Myofascial Pain Syndrome, 3. Bursitis, 4. Capsulitis, 5. Contusion, 6. Headaches: Vertebrogenic, Muscle Contraction, Migraine, Vascular, 7. Mechanical/Joint Dysfunction (Uncomplicated), 8. Mild Sacroiliac Syndrome, 9. Mild Sprain, 10. Mild Symptomatic Degenerative Joint Disease, 11. Mild-Moderate Strain, 12. Mild-Moderate Tendinitis, 13. Subluxation (Uncomplicated), 14. Synovitis, 15. Torticollis (Acquired)	**0-6 wks**
II	1. Chronic facet syndrome, 2. Chronic myofascial pain syndrome, 3. Chronic sacroiliac syndrome with marked myofascial pain syndrome, 4. Chronic tendinitis, bursitis, capsulitis, synovitis, 5. Mechanical joint dysfunction (complicated), 6. Moderate sacroiliac syndrome, 7. Moderate sprain, 8. Moderate-marked strain, 9. Post traumatic mild-moderate myofibrosis, 10. Post traumatic periarticular fibrosis and joint dysfunction with marked tendinitis, bursitis, capsulitis, synovitis, 11. Subluxation (complicated)	**2-12 wks**
III	1. Adhesive capsulitis (frozen joint), 2. Chronic facet syndrome associated with clinical vertebral instability, 3. Marked sprain with associated instability/dysfunction, 4. Marked strain associated with post traumatic myofibrosis and/or joint dysfunction, 5. Moderate inter-vertebral disc syndrome w/o myelopathy, 6. Moderate to marked temporomandibular joint dysfunction, 7. Partial or complete dislocation 8. Peripheral neurovascular entrapment syndromes, 9. Thoracic outlet syndromes,	**1-6 mon**
IV	1. Acceleration/deceleration injuries of the spine with myofascial complications (whiplash), 2. Cervicobrachial sympathetic syndromes, 3. Intermittent neurogenic claudication, 4. Lateral recess syndrome, 5. Marked inter-vertebral disc syndrome w/o myelopathy, with or without radiculopathy, 6. Severe strain/sprain of cervical spine with myoligamentous complications 7. Sympathetic dystrophies,	**2-12 mon**

Table 19
Oregon & North Carolina State Boards Complicating Factors that may indicate the need for more care[342-343]

1. Aggravations
2. Congenital or developmental defects
3. Degenerative disorders
4. Exacerbations, flare-ups
5. Obesity
6. Previous injury
7. Psychosocial compromise
8. Smoking
9. Systematic Diseases

Table 20
Oregon & North Carolina State Boards Definitions[342-343]

Preventive care	(a) Reduction of the incidence and/or prevalence of illness, impairments, and risk factors, and the maintenance of optimal functions. (b) Appropriate in an outwardly healthy individual who may have no symptoms and in whom signs of illness or impairment may be absent, minimal or subclinical
Supportive care	(a) Sustains previous therapeutic gains that might otherwise progressively deteriorate. (b) Follows appropriate application of acute care and rehabilitation and includes concurrent life style modification efforts (c) is intended to minimize complications and degenerative sequelae (d) Appropriate for a patient who has reached maximum therapeutic benefit (MMI), and in whom periodic trial of therapeutic withdrawal fail (e) Appropriate when rehabilitative and/or functional restorative and alternative care options, including home-based self-care and life style modification, have been considered and attempted (f) Appropriate in patients who display persistent and/or recurrent signs of illness or impairments. (g) Chiropractic doctors commonly recommend monthly visits for the purpose of supportive care. More frequent visits may be clinically justified

In the remainder of this section, we will compare various State Workers Compensation Guidelines (Tables 21-26) for Chiropractic care to the ICA's Evidence-Based Frequency and Duration Programs of Care #1-#7.

Tables 21-26 represent some conditions, definitions, Frequency, Duration, and complicating factors for the States of Oregon, North Carolina, Massachusetts, Colorado, Washington, New York, Wisconsin, and Minnesota.[345-351]

We note that their Frequency and Duration reccomendations are quite arbitrary, made to reduce costs, and are not determined to optimize employee return to pre-injury condition. We finish this section with an analysis of the effects on the income of MDs, PTs, and DCs in Washington State after changes to Workers Compensation Guidelines in the early 1990's, keeping in mind it likely represents a trend in the USA.

Table 21
Massachusetts Workers Compensation Chiropractic Treatment Sessions and Definitions[345]

Description	DC Treatment Sessions
Neck & Back Spinal injuries: Conservative Outpatient Treatment: 0-6 weeks from date of injury	max 18 visits in first 6 wks
Conservative Outpatient Treatment: 7-12 weeks from date of injury	max 10 visits between wks 7 & 12 (total: 28 visits in 12 wk)
Chronic Neuromusculo-skeletal injury (after initial treatment)	Max 16 visits in 8 mon at end of other NMS Guidelines
Chronic Pain Syndrome (after initial treatment provided)	Max 20 visits

Table 22
Colorado Pain Disorders with Frequency & Duration of Care[346]
Refer to the separate Chronic Pain Guidelines for care beyond 3 months.

	Time to produce an effect	Frequency	Duration
Cervical Spine Injury	1 to 6 treatments	(a) 3visits/wk for the first 4 week (b) then 2x/wk for 4 weeks	**(a)** Optimum Duration: 8 to 12 weeks **(b)** Maximum Duration: 3 months
Low Back Pain	1 to 6 treatments.	(a) 3visits/wk for the first 4 week (b) then 2x/wk for 4 weeks © 2/wk or less to maintain function	**(a)** Optimum Duration: 8 to 12 weeks **(b)** Maximum Duration: 3 months
Chronic Pain Disorder	4 to 6 treatments	1-2 visits /wk for 2 wks +1 visits/wk for 6 wks and if needed add 2 visits /mon until MMI	20 visits in first 3 months plus added care as needed

Table 23
Washington State Care Plans & Frequency and Duration[347-348]
Chiropractic Re-imbursement was Drastically Reduced After 1990 Using the Expected Frequencies and Durations Defined Here

Care Plans	Appropriate Care	Expected Frequency & Duration	Total
Simple joint & muscle dysfunction	adjusting, manipulation, myofascial work, home mobility & stretching, postural & ergonomic counseling	2-3 visits/wk, decreasing in frequency over a 2-4 wk period. A one-month follow up exam	***Under 9 visits in 8 weeks.***
Acute external trauma with soft tissue trauma-Mild	Early passive movements & use of ancillary procedures to reduce pain & inflammation, spinal adjusting, myofascial work, resisted isometric & stretching rehabilitative exercise & home cryotherapy	With degree of trauma, 3-5 visits/wk initially, then decreasing frequency. Long term follow-up, for 2-4 mon, since many symptoms may not begin until 6-8 wks post trauma	***14-18 visits over 2-4 mon***
Acute external trauma with soft tissue trauma-Moderate	Early passive movements & ancillary procedures to reduce pain & inflammation, spinal adjusting, gentle myofascial work, resisted isometric & stretching rehabilitative & home cryotherapy	With degree of trauma ,3-5 visits/wk initially, then decreasing frequency. Long term follow-up, for 3-5 mon, since many symptoms may not begin until 6-8 wks post trauma	***18-24 visits over 3-5 mon***
Acute external trauma with soft tissue trauma-Severe	Early passive movements & ancillary procedures to reduce pain & inflammation, spinal adjusting, gentle myofascial work, resisted isometric & stretching rehabilitative & home cryotherapy	With degree of trauma ,3-5 visits/wk initially, then decreasing frequency. Long term follow-up, for 3-6 mon, since many symptoms may not begin until 6-8 wks post trauma	***24-30 visits over 3-6 mon.***
Lumbar facet syndrome	HVLA adjusting along with gentle active exercise. Healing quickly, without residuals	3visits/ wk for 2 wks & 1 visit/wk for 2 more weeks. 1-2 times over the next 4 weeks follow-up.	***8-9 visits over 8 weeks.***
Acute lifting injury with strained contractile tissue	Myofascial work, adjusting & gentle active exercise. Healing quickly, without residuals.	3visits/ wk for 2 wks & 2 visits/ wk for another 2 wks. Follow-up next 4-6 wks at 1/2 visits per wk.	***2-14 visits over 8-10 weeks***
Acute lifting injury with Sprained Non-contractile tissue	Cryotherapy (ice), myofascial work, adjusting & gentle active exercise. Response depends on the extent & location of non-contractile tissue	3visits/ wk for 2 wks & 2 visits/wk for another 3 wks. Follow-up next 5-7 wks at 1/2 visits per wk.	***14-16 visits over 10-12 weeks.***
Chronic Myofibrositis	passive & active movement. Care includes aggressive deep myofascial work, long term stretching exercise, heating modalities & conditioning if response is poor	2-3 visits/ wk initially, reducing 1 visit/wk if improve in 1st 2-4 wks. self-dependent. Beyond 6-8 wks is PRN only if patient complies active stretching & ROM home exercise	***10-14visits over 8-12 weeks.***
Exposure to repetitive trauma during care	Temporary increase in treatment frequency of 2-5 visits is reasonable & beneficial.	2-3 additional sessions over a 1-2 week period.	***2-6 visits over 1-2 weeks.***
Possible discogenic involvement without Neurologic signs	Myofascial work, flexion distraction & adjusting, along with home regimen of exercises will reduce spasm & increase ROM.	Initial care plan follows probable disc diagnosis protocol, remainder of care dependent on the determination of disc involvement	***Up to 10 visits in 1st month. Then care plan for appropriate diagnosis.***
Probable discogenic involvement without neurological signs	Myofascial work, flexion distraction & adjusting, along with a home regimen of exercises will reduce spasm and increase ROM.	usually several mon duration, initial frequency at 3 or more visits/wk, gradually reducing to PRN frequencies of 1/ month	***24-28 sessions over 5 months.***
Probable discogenic involvement with soft neurologic signs	Myofascial work, flexion distraction & adjusting, along with a home regimen of exercises will reduce spasm & increase ROM.	usually several mon duration, initial frequency at 3 or more visits/wk, gradually reducing to PRN frequencies of 1/mon to discharge.	***26-30 sessions over 5-6 months.***
Probable discogenic involvement with firm neurologic signs	Myofascial work, flexion distraction or McKenzie exercises, with spinal adjusting, with a prescription for a home regimen of exercises, will reduce spasm and increase ROM.	usually several mon duration, initial frequency at 3 or more visits/wk, gradually reducing to PRN frequencies of 1 per month to discharge.	***26-32 sessions over 6-8 months.***

Table 24
New York WC Medical Treatment Guidelines[349]

Condition	Frequency	Duration
Low Back Injury Acute, subacute & Chronic	8 to 12 visits over	6 to 8 weeks
Cervical Spine Injury	(1) 3 visits/wk for 1sr 4 wks by the severity of involvement & the desired effect, (2) 2 visits/wk for next 4 wks. (3) Further treatments, 2 visits/wk or less to maintain function.	Optimum Duration: 8 to 12 weeks. Maximum Duration: 3 months.

Table 25
Wisconsin's General Treatment Guidelines for Low Back Pain, Neck Pain, and Thoracic Back Pain[350]

Type Of Care	Definition	Time For Response	Max Frequency	Maximum Treatment Duration
Adjustment or manipulation of joints	"adjustment or manipulation of joints" includes chiropractic and osteopathic adjustments or manipulations	3-5 visits	5 times per week for the first one to 2 weeks decreasing in frequency until the end of the maximum treatment duration period in subd. 3.	12 weeks.
Manual therapy.	"manual therapy" includes soft tissue and joint mobilization, therapeutic massage, and manual traction	3-5 visits	5 times per week for the first one to 2 weeks and decreasing in frequency until the end of the maximum treatment duration period in subd. 3.	12 weeks

Table 26
Minnesota Workers Compensation: Back, Neck & Thoracic pain[351]

Adjustment Or Manipulation Of Joints	Time For Response	Max Frequency	Max Duration
chiropractic and osteopathic	3-5 Treatments	Up to 5 visits/wk for 1st 1-2 wks + decreasing thereafter	12 weeks

Analysis of Washington State Labor & Industry Guidelines after 1988

When Washington State Labor and Industries began a new audit plan, termed CPE (Comprehensive Provider Evaluation) in 1988, it hired a Chiropractor (Mootz) circa that same time. The Chiropractors in that state thought that changes in Washington Workers Compensation policies would be made to make the playing field level for Chiropractors, Physical therapists, and Medical Doctors. This turned out to not be the case.

In fact, soon after the chiropractor was hired by Washington L&I, the Workers Compensation income of Chiropractors took a nose dive, while payments to MDs and PTs rose swiftly (see Figure 2). This is because the threats of audits and arbitrarily short, unsupportable Frequencies and Durations were applied to Chiropractors in Washington.

These types of short frequencies and durations were not applied equally to DCs, PTs, and MDs. Thus, one can note that since the hiring of Mootz and the CPE audit plan, Washington Chiropractors have seen a decreasing percentage of total Workers Compensation budget in Washington State. Before 1989, the total L&I payments to DCs in Washington were rising, as patients used their right to select the doctor of their choice. After CPE, total Chiropractic payments drastically reduced, while total L&I payments to PTs and MDs increased substantially. Total payments to DCs dropped from $23 million in 1988 to $15 million in 1997, while payments to MDs increased from $47 million in 1988 to $75 million in 1997 and PTs State L&I payments increased from $12 million in 1989 to $31 million in 1997.[352]

It is obvious that DCs were singled out for reduction by the Washington State L&I policies. While payments to MDs and PTs were almost doubled in 10 years ($47 mil + $12 mil in 1989 to $75 mil + $31 mil in 1997 is $106 mil/$59 mil = 1.8 times), L&I payments to DCs dropped ($23 mil-$15 mil = $8 mil, or ≈ 35% decrease) more than a ⅓ during that same 10 years period.[352] Such inequitable numbers could be explained by the influence of the Washington State AMA on Washington L&I and with the policy ideas of the hired chiropractor.

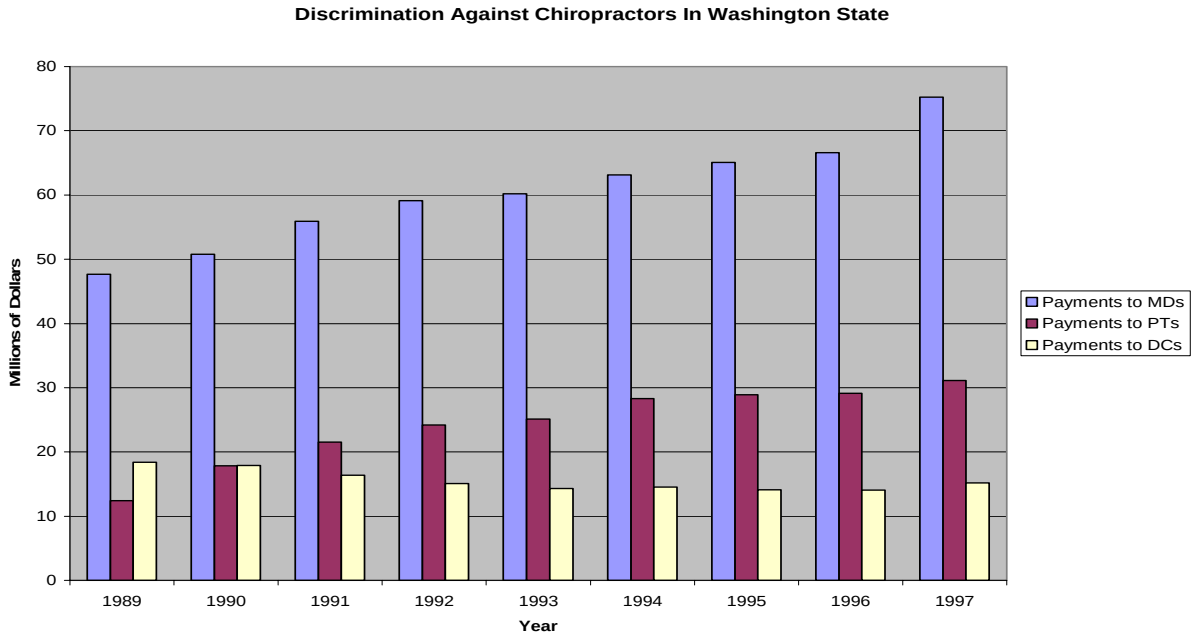

Figure 2

Payments to Washington State Chiropractors greatly deceased while payments to MDs and PTs greatly increased after a Chiropractor was hired by Washington L&I in the early 1990s. Instead of making Workers Compensation more equable for DCs, after this hiring, the discrimination got worse and low arbitrary Frequencies and Durations were applied to DCs under Workers Compensation in Washington.[352]

For treatment guidelines, the Ohio Bureau of Workers' Compensation web site[353] states, "Each managed care organization (MCO) must use nationally recognized treatment and

return-to-work guidelines to evaluate the necessity and/or effectiveness of medical care, and be able to use these guidelines to communicate and educate providers in all decision correspondence. Most MCOs use *Milliman and Robertson, Healthcare Management Guidelines™, Volume 7,* and *Mercy, Guidelines for Chiropractic Quality Assurance and Practice Parameters*."

In summary for this Workers Compensation Section, many Canadian Provinces and US State agencies use non-evidence-based guidelines for Chiropractic Frequency and Duration. Any State and Provincial Workers Compensation Guidelines should be updated with the six basic ICA Frequency and Duration Programs of Care suggested in this document.

California

From 2005 to 2008, the nature of Workers Compensation in California was very restrictive toward chiropractic because of a few bad apples that, "milked the system." The data from the Workers Compensation Research Institute's (WCRI at http://www.wcrinet.org/benchmarks/benchmarks_06/benchmarks_06_tbl-B.html) Interstate Comparison of 2003 and 2004, referred to above in Chapter 5, reveals the fundamental unfairness of the Workers Compensation restrictions imposed on California chiropractors since 2005.

The average medical payment per claim for a California physician was $3,698, while the average payment per claim for a California chiropractor was $3,929. On average chiropractors charged $231 more than MDs in 2003 and 2004. The WCRI Interstate Comparison also shows that physicians saw patients an average of 16.2 times and provided an average of 2.3 services per visit. The arithmetic reveals that for the cost of $3,698, MDs provided an average of 37.3 services. Chiropractors, on the other hand, treated patients an average of 38.8 times with 3.4 services per visit. Therefore, for their $3,929, patients of chiropractors received an average of 131.9 services; 94.6 services more than MDs.

Thus, since 2005 the state of California has lost money paying MDs more and patients have received fewer services.

VIII. Pediatrics (data from ICA's Best Practices in Chapter 10)

In this section, Pediatrics will be analyzed for Frequency and Duration with data from the ICA data base discussed in the previous Chapter 10.

In Chapter 10, it was noted that there were/are at least 16 RCTs published on the pediatrics age group (0-17 years of age). Table 27 lists these 16 RCTs with the quality score given by ICA reviewers. It is noted for the 188 RCTs (on all conditions treated with SMT) in the ICA Best Practices data base, the average score of an RCT was 16 (out of 26 points possible). In Table 22, it is noted the average score of these 16 pediatric RCTs is 16. Thus, these 16 pediatric RCTs appear to have the same quality as the average of all 188 RCTs on chiropractic methods.

There were so many pediatric publications in the ICA Best Practices data base that it was decided to break the presentation of this data into Level 1, 2, 3, and 4 data and then to separate Level 4 data into age groups. First, we note there were no Level 2 studies (Non-

randomized Clinical Trials) on Pediatrics with Chiropractic care. Second, we define three age groups within Pediatrics and within aged groups 0-65+:

Age of subject

0-1	***Infant And Pediatric***
1-10	***Child And Pediatric***
11-17	***Adolescent And Pediatric***
18-34	***Young Adult***
35-50	***Middle Adult***
51-64	***Older Adult***
65+	***Geriatric***

Third we note out of 250 Clinical studies listed with pediatric patients[354-604] in Tables 27-31. There are several reference redundancies. Since some studies mixed a variety of age groups, it was decided we keep complete data in the separate tables for those who wish to search through this data.

Fourth, we note by far, the largest number of pediatric clinical studies in the ICA's Best Practices data base was in the category of Level 4 studies which must not be neglected. (see Tables 29-31, where clinical studies were split into the three pediatric age groups: Infants, Children, Adolescents).

Table 27
There are 16 RCTs published on Chiropractic Care of Pediatrics

Author	Points	Treatments	Weeks	Positive Outcome?
Balon, Jeffrey, MD; 1998	18	28	16	Yes
Bronfort, Gert DC PHD; 2001	18	20	12	Yes
Erhard, Richard E., PT; 1994	15	3	1	Yes
Gemmell, Hugh A DC; 1995	12	1		Yes
Guiney, Peter A DO; 2005	15	1	1	Yes
Kessinger R; 1998	16	7	6	Yes
Khorshid, Khaled A. DC MS MBBCh; 2006	16		12	Yes
Khorshid, Khaled A., DC; 2006	12	24	12	Yes
Leboeuf-Yde, Charlotte DC, MPH; 1991	14	8	2	Yes
Mills, Miriam V MD; 2003	18	9		Yes
Olafsdottir, E; 2001	18			Yes
Petersen, S L; 2003	16	8	4	Yes
Rowe, Dale E ; 2006	18	26	24	Yes
Sawyer, Charles E. DC; 1999	13	10	4	Yes
Stakes, Neil Osmond MTC; 2006	17	6	4	Yes
Wiberg, Jesper M DC; 1999	16	3.8	2	Yes
Averages:	***16***	13	8	

Table 28
There are 13 Level 3 Studies Published on Chiropractic Care of Pediatrics

Author	Points	Treatments	Weeks	Positive Outcome?
Bahan, Joseph R D.C. ; 1994	13			Yes
Brzozowske, Walter; 1977	11	62	78	Yes
Brzozowske, Walter T., DC; 1980	11	72	86	Yes
Cohen, Edward DC; 1988	10	20	8	Yes
Diakow, Peter R DC; 1991	14			Yes
Dong, Wen-yi, MD; 2007	8	10	7	Yes
Fallon, Joan DC, FICCP; 1997	15	5		Yes
Gemmell, Hugh A; 1989	11	10	5	Yes
Haas, Mitchell DC MA; 2005	15			Yes
Killinger, Lisa Z DC; 1998	11	2	3	Yes
Stephens, Danny DC; 1997	16	7	4	Yes
Vallone, Sharon DC, FICCP; 2004	11	3		Yes
Averages:	**12**	**25**	**26**	

Table 29
30 Adolescents Chiropractic Level 4 Studies (Observational without Controls, 11-17 years)

Author	Points	Treatments	Weeks	Positive Outcome?
Anglen RL; 1999	10	8	17.2	Yes
Baldwin, Christopher S BS; 1996	9		2	Yes
Barbuto, L.; 1977	11			No
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Brzozowske, Walter T DC; 1977	7			Yes
Buchberger DJ; 1993	9			Yes
Gasparovic, Frank R, DC; 1996	7		2	Yes
Gossett, Laurie D.C.; 1999	6	32	63	Yes
Guadagnino III MR; 1999	13	84	34	Yes
Hession, E F DC; 1993	14			Yes
Hewitt, ELise G DC; 1994	10	4	2	Yes
Hoven JJ, ; 2000	9	11		Yes
Hunt, Julie M DC; 2000	13	40	46	Yes
Kaszans ES,; 2004	9		6	Yes
Kazemi, Mohsen RN DC; 1999	12	57	30	Yes
Kessinger RC,; 2000	10	22	10	Yes
Killinger, L.Z., DC; 1995	13	6	260	Yes
Liesman, Natalie J; 1998	11	9		Yes
Luellen, Jodi DC, DICCP; 2004	9	16	8	Yes
Mawhiney RB.; 1999	11	22	4	Yes
Meyer, Donald W.; 2002	9	29	20	Yes
Morningstar, Mark DC; 2007	11	90		Yes
Palmer, BJ DC, PhC; 1930	6			Yes
Purse, F M DO; 1966	8	4	4	Yes
Smith, Vernon C; 1992	7			Yes
Stude, David E DC; 1998	10	22	16	Yes
Van Breda, Wendy M DC; 1993	5			Yes
Weigand, R. DC; 2005	14		24	Yes
Wong, L R DC; 1993	10	12	4	Yes
Averages:	**10**	**28**	**31**	

Table 30
There are 153 Chiropractic Level 4 Studies (Observational without Controls) on Children aged 1-10 years

Author	Points	Treatments	Weeks	Positive Outcome?
Alcantra, Joel DC; 2003	10	53	20	Yes
Anderson, Christine D.; 1993	14	216	72	Yes
Anderson, Christine DC; 1994	11			Yes
Araghi, H. Jason, DC; 1995	10	4	4	Yes
Araghi, J; 1995	9	5	5	Yes
Augilar, Andrew L., DC,MBA; 2000	12		36	Yes
Bahan, Jose R, DC; 1994	6			Yes
Bahan, Joseph R. DC;	10			Yes
Bahan. Joseph R., DC; 1994	8			Yes
Barber, Virginia A DC; 2002	11	30	92	Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blanchard, M DC; 1950	12			Yes
Blood, Stephen D DO; 2000	6	1	0.14	Yes
Burnier, Arno DC; 1995	6			Yes
Cheung Woo, Chun DC; 1987	10	1	1	Yes
Chorny, Scott B; 1993	7			Yes

Table 30 Continued…

Author	Points	Treatments	Weeks	*Positive Outcome?*
Cohen, Eddy; 1995	5	8	8	Yes
Conway, Cynthia M DC, DICCP; 1997	13			Yes
Cuthbert, Scott C; 2006	12			Yes
Davies, Neil J.; 2002	12	3	3	Yes
Day MO; 1991	17	250	250	Yes
Dobson GJ; 1996	14	170	156	Yes
Doscher, Bobby; 2002	11	43	22	Yes
Elster, Erin L.; 2003	10	2	20	Yes
Elster, Erin L.; 2003	12	6	12	Yes
Eriksen, K DC; 1996	10	5	23.65	Yes
Eriksen, Kirk D.C.; 1994	7	5	12	Yes
Fedorchuk, Curtis; 2007	13		17	Yes
Froehle, Rosann M DC; 1996	12			Yes
Fysh, Peter N. DC FICCP; 1998	7			Yes
Gambino, Daniel W.; 1995	15	74	56	Yes
Garde, R DC; 1994	12	64	52	Yes
Giesen, J. Martin, PhD; 1989	10			Yes
Gindl, Pamela S BSC, DC, DICCP; 2004	10	29	16	Yes
Gioia, Anthony V DC, CCRD; 1996	8	6	6	Yes
Gluck, George BA; 1955	10	57	33	Yes
Goldman, Stephen R DC; 1969	14	6	2	Yes
Gorman, R. Frank; 1995	14	1	1	Yes
Haselden, P; 2006	10		8	Yes
Hayden, JA; 2002	8			Yes
Hayden, Jill A., DC; 2003	9			Yes
Heagy, Danita T DC; 1996	13			Yes
Hewit, Elise G.; 2004	10	5	3	Yes
Hospers, Lasca A DC; 1987	9	1	6	Yes
Hunt, Julie M DC; 2000	11	11	17.85	Yes
Hyman, Christine A DC; 1996	13			Yes
Inselman, Paul S DC; 2002	13	3	1	Yes
Inselman, Paul S DC; 1998	12		1.5	Yes
Irowa, GO; 1989	13		3	Yes
Jamison, Jennifer R; 1986	15	7	5	Yes
Kleinfeld Marko, S DC; 1997	10	21	17	Yes
Knutson, Gary A DC; 1996	13	12	10	Yes
Knutson, Gary A. DC; 2003	11	1	1	Yes
Koren, Ted; 1994	9			Yes
Langley, Cheryl; 1994	12		52	Yes
Lines, Dean H.; 1993	11			Yes
Lisi, Anthony J DC; 2002	10	5	16	Yes
Lovett, Lisa; 2006	10	8	8	Yes
Manuele, J D DC; 1996	8		7	Yes
Manuele, Jack E.; 2004	14	41		Yes
Marko, R.; 1996	12	321	123	Yes
Marko, RB DC; 1998	10	15	7	Yes
Marko, Richard B DC; 1994	7	5	79.5	Yes
Marko, Stephanie K DC; 1998	10	14	6	Yes
Mawhiney, R B DC; 1994	11	17	5	Yes
McCoy, Matthew, DC; 2006	10	12	4	Yes

Table 30 Continued…

Author	Points	Treatments	Weeks	*Positive Outcome?*
Mootz, Robert D DC; 1999	11	15	16	Yes
no author listed; 1963	9	11	6	Yes
Nunno, Laura V RN DC DICCP; 2007	9	120	40	Yes
Palmer, BJ; 1955	13	3	7	Yes
Palmer, BJ; 1951	13	31	8	Yes
Palmer, Bj ; 1951	11			Yes
Palmer, Bj DC, PHC; 1930	6			No
Palmer, Bj DC, PHC; 1930	6			Yes
Palmer, Bj DC, PHC; 1930	7			Yes
Palmer, BJ DC, PhC; 1930	10	138		Yes
Patterson, David DC; 1989	8	31	104	Yes
Pauli, Yannick, DC; 2007	12	16	8	Yes
Peet, J; 1995	13	15	7	Yes
Peet, Jennifer ; 1993	11			Yes
Peet, Jennifer B; 2000	12		2	Yes
Peet, Jennifer DC; 1994	8	3	12	Yes
Peet, Jennifer B; 1997	11		21.5	Yes
Peet, Jennifer B; 1999	9	6	2	Yes
Peet, Jennifer B ; 1993	12			Yes
Peet, Jennifer B DC; 1996	10			Yes
Peet, Jennifer B DC; 1997	8	36	12	Yes
Peet, Jennifer B DC; 1997	8	48	16	Yes
Peet, Jennifer B., DC; 1996	11	26	38.7	Yes
Peet, Jennifer Brandon, DC; 1998	10	28	24.5	Yes
Perdian, Timothy A DC; 1993	10	30		Yes
Perri, Vincent L DC; 1984	8	15	3	Yes
Pope, Michael DC; 1994	15	95	60	Yes
Potisk, T.J.; 2002	10		2	Yes
Quist, David M; 2006	14	12	4	Yes
Ritchie, Bevrerly; 1994	15			Yes
Rubinstein, Henry DC; 1994	12		42	Yes
Sandeufur, Ruth MS DC; 1987	10	40	36	Yes
Saunders, Louise; 2004	12	4	2	Yes
Sharp Jan C DC; 1999	12			Yes
Smith, Thomas L.; 2000	12	2	1	Yes
Stephens, Danny D.C.; 1996	9	5		Yes
Sweeny, Aine DC; 1997	9	12.5	2.5	Yes
Taub, Arnold DC; 1995	7	30	4	Yes
Terrett, Allan ; 2002	7			Yes
Thomas, Danita DC, FICA; 1997	10	38	31.8	Yes
Vallone Sharon DC; 1998	9	6	3	Yes
Vallone, Sharon DC, DICCP (F); 2006	13	14	52	Yes
Van Loon, Meghan PT, DC; 1998	12	4	2	Yes
Webster, Larry DC; 1996	10	9	7	Yes
Woo, Chun-Cheung DC; 1993	14	30	26	Yes
Young, A. ; 2004	7			Yes
Young, Antoinette; 2007	10	10	104	Yes
Zhang, John Q.; 2004	10	6	2	Yes
Average Points:	**11**	**36**	**25**	

Table 31
There are 41 Chiropractic Level 4 Studies (Observational without Controls)
on Infants aged 0-1 years

Author	Points	Treatments	Weeks	Positive Outcome?
Anderson-Peacock, E.S. BSc DC; 1996	8			Yes
Bachman, Trent R; 1995	10	28	64.5	Yes
Blum, CL; 1999	11	72	104	Yes
Camerino, William J DC; 1961	12			Yes
Colin, Nancy; 1998	12	6	6	Yes
Collins, Karen, F; 1994	8	0	0	Yes
Cuhel, Janet M.; 1997	12	0	0	Yes
Davies, Neil J DC; 2007	7	48	28	Yes
Fysh, Peter N DC BAPP.SC; 1996	5			Yes
Graham, Robert L DC; 1997	11		8	Yes
Gutmann G.; 1987	9	2.5	4	Yes
Harris, Scott L DC; 1993	14	22	10	Yes
Hart, Dennis L. DC ; 1991	7	3	3	Yes
Hewitt EG; 1993	14	3	1	Yes
Hewitt, Elise G DC, CST; 1999	13	3	3	Yes
Hipperson, Andrea; 2004	12	9	3	Yes
Holtrop, David P DC, DICCP; 2000	12	5	2	Yes
Hunt, Julie M DC DICCP; 2000	12	8	8	Yes
Hyman, C DC DICCP; 1997	10	8	6	Yes
Hyman, C.A., D.C; 1996	9	16	10	Yes
Jamison, Jennifer MBBCh PhD EdD; 2006	6	3	4	Yes
Klougart, Niles DC; 1989	9		4	Yes
Krauss, Lori DC; 1994	5	14		Yes
Krauss, Lori DC; 1995	8	22	12	Yes
Larkin-Thier, SM; 1994	10	7	3	Yes
Leach, Robert A D.C.; 2002	9	9	5	Yes
Marko, Stefanie; 1996	10			Yes
Marko, Stephanie K DC; 1994	11	24	8	Yes
Palmer, BJ; 1911	9	6	1	Yes
Palmer, BJ DC; 1951	8	27		Yes
Palmer, DD; 1905	4			Yes
Parnell, Carol A BS DC DICCP; 2000	10	18	12	Yes
Pederick FO; 2004	9	6	12	Yes
Peet, Jennifer DC; 1993	12	93	169	Yes
Phillips, Nicholas J, DC; 1992	11	3	1	Yes
Pluhar, George; 1991	7	3	2	Yes
Rome, Peter L; 1996	9	4	9	Yes
Rowswell-Kulikowski, Alaina MD; 2007	9	16	16	Yes
Rubin, Drew; 2007	9	3	0.34	Yes
Sheader, Wesley E DC; 1999	9	13	3.4	Yes
Smith-Nguyen, Emily J DC; 2004	12	7	10	Yes
Sully, Charles L DC; 1951	11			Yes
Toto, Blase J DC; 1993	10	36	12	Yes
Vallone, Sharon; 1997	14	6	4	Yes
Vallone, Sharon DC, FICCP; 2007	12	27	7	Yes
Walton, Alfred MD; 1914	6			Yes
Watson, John G.; 1993	9	9	6	Yes
Averages:	**10**	**16**	**16**	

Table 32 summarizes the ICA Best Practices data for pediatrics. Note, even though the Level 1 studies are included, when the patient has not reached MMI, which data was collected at an arbitrary cut off number of visits, the average Frequency and Duration is 20 visits in 20 weeks. This is nearly equivalent to the ICA Frequency and Duration Program of Care #1, except the pediatric patient is followed up for 20 weeks instead of the maximum of 11 weeks in the ICA Program #1.

This data in Table 32 indicates care of the pediatric patient has an extensive and substantial support in the published literature.

Table 32
Values and Averages of Table 27-32 From ICA Best Practices Data

Table	Level	Points	Treatments	Weeks
27	1	16	13	8
28	3	12	25	26
29	4	10	28	31
30	4	10	16	16
31	4	10	16	16
	Averages	**12**	**20**	**20**

IX. Functional and Structural Rehabilitation of Subluxation

Probably the groups most interested in Rehabilitation are the MD Physiatrists, Physical Therapists (PT), Occupational Therapists (OT), and Chiropractors. Since Webster's dictionary defines "Rehabilitation", as, "the process of restoring condition of health or useful and constructive activity", goals of Rehabilitation are not just the elimination of pain and improvements of the activities of daily living, but the restoration of proper function of the joints.

In this document, we frequently remind the reader that Guidelines are often either, (a) made up of personal opinions or (b) are from averages of treated patients. Guidelines are suggestions, which must be altered by follow-up examination information obtained from the individual patients. To this end, we provide a quote from the American Physical Therapy Association's (ATPA) web site: "APTA defines a 'guideline' as a statement of advice."[605]

Rehabilitation can be for the spine and/or extremities. In fact, extremity rehabilitation has a long history in Chiropractic practice as DD Palmer in his 1910 text stated that 95% of his attention was to the spine and 5% was to the extremities.[606] DD Palmer noted there is a relationship between spine and extremity joints of the body which should not be neglected by the chiropractor or taken lightly in treating a patient. All chiropractors graduating from chiropractic schools still learn this today.

There are two distinct approaches to rehabilitation in the chiropractic profession, Functional Rehabilitation and Structural Rehabilitation. A type of Functional Rehabilitation is promoted by the ACA Council on Chiropractic Physiological Therapeutics and Rehabilitation,[607] Christensen,[608] Liebenson,[609] and Janda,[610] Structural Rehabilitation is promoted in Pettibon Technique,[611-612] in ASBE,[613] and in Harrisons' CBP Technique. [157-161,614-617]

Aside from our standard SMT, or the classic chiropractic adjustment, Functional Rehabilitation can be defined as improving quality of motion (proper sequence of muscle movement), stretching, and active exercise programs that increase range of motion, increase strength, decrease pain, and increase activity levels of daily living. Structural Rehabilitation can be defined as programs

of exercise, stretching, and traction that change the patient's posture and spine toward normal 3-Dimensional alignment, and thereby normalize range of motion, increase strength, decrease pain, and increase activity of daily living levels.

While CCGPP Guidelines[5] indicate there is no support for any modalities in the care of low back pain syndromes, in a 2007 published review of 38 systematic reviews of therapeutic exercises from 2002-2005, Taylor et. al.,[618] stated, "therapeutic exercise was beneficial for patients across broad areas of physiotherapy practice." In a 2006 Cochrane review, Bendermacher et al[619] stated, "supervised exercise therapy is suggested to have clinically relevant benefits compared with non-supervised regimens". Thus, exercises must be a main component of any rehabilitative program; whether functional or structural, but should be in-office supervised for reasons of patient safety, effectiveness, and care compliance.

We had difficulty finding any Frequency and Duration parameters for Rehabilitation. We searched the web sites of Physiatrists, PTs, OTs, and Chiropractors. The only Frequency and Duration recommendations were found from the Reed Group.[620] Table 33 summaries the Reed Groups Frequency and Duration suggestions for a few conditions.

Table 33
Reed Group: Rehabilitation Codes for PTs with Frequency and Duration[620]

Condition	ICD-9-CM	ICD-10	Frequency	Duration
Carpal Tunnel	354,354.0	G56, G56.0, G56.1	15-20 visits	6-8 weeks
Joint Disorders*	716.9, 719, 719.0, 719.9, 719.90, 719.92, 719.93, 719.94, 719.26, 719.97, 719.98, 719.99	M13.8, M13.9, M16.9, M24.0, M24.4, M24.6, M24.8, M24.9, M25, M25.0, M25.1, M25.2, M25.3, M25.4, M25.9, M36.3	Long term depending on type of arthritis	
Muscle Injury$	724, 728.8, 728.83, 728.9, 840, 841, 842, 843, 843.0, 843.8, 844, 844.9, 845, 846, 847, 948, 848.8, 848.9, 905, 920, 922, 922.0, 922.1, 922.2, 922.3, 922.31, 922.32, 922.8, 923, 924	S09.1, S16, S29.0, S39.0, S46, S46.1, S46.2, S46.3, S56, S66, S76, S76.0, S76.1, S76.3, S86, S86.2, S86.3, S86.7, S86.8, S86.9, S96, S96.1, S96.2, S96.7, S96.8, S96.9, T09.5, T14.6, T79.6, T92.5, T93.5	Mild: 4 visits	3 weeks
Osteoarthritis	715,715.0, 715.00, 715.1, 715.10, 715.11, 715.12, 715.13, 715.14, 715.15, 715.16, 715.17, 715.18, 715.19, 715.2, 715.20, 715.21, 715.22, 715.23, 715.24, 715.25, 715.26, 715.27, 715.28, 715.29, 715.3, 715.30, 715.31, 715.32, 715.33, 715.34, 715.35, 715.36, 715.37, 715.38, 715.39	M15.0, M15.1, M15.2, M15.3, M15.4, M15.8, M15.9, M16.0, M16.1, M16.2, M16.3, M16.4, M16.5, M16.6, M16.7, M16.9, M17.0, M17.1, M17.2, M17.3, M17.4, M17.5, M17.9, M18.0, M18.1, M18.2, M18.3, M18.4, M18.5, M18.9, M19.0, M19.1, M19.2, M19.8, M19.9, M24.7	20 visits	10 weeks
Displacement/Herniation, Cervical Intervertebral disc without Myelopathy	722.0	M50.1, M50.2, M50.8	12 visits (uncomplicated case)	6 weeks
Neck Pain, Cervicalgia	723.1, 723.2	M53.0, M54.2	12 visits (uncomplicated case)	6 weeks
Thoracic Disc disorder with Myelopathy	722.31, 722.7, 722.72, 722.90, 722.92	M51, M51.0, M51.9	Up to 25 visits	10 weeks

* Decreased ROM, Frozen Joint, Osteoarthritis, Rheumatoid Arthritis
$ Mild, moderate, severe of many types including bruises, strains, repetitive exercise, avulsion

From physiatrists Rand et al,[621] we present Table 34, which has definitions of some common types of exercises. We also adopt Rand et al.'s Table of PT prescriptions, which lists the phase of healing, modalities suggested, exercises suggested, manual therapy suggested, a few brief frequency and durations, and goals of care (Table 34). Note the maximum duration is only 4 weeks. They only suggest joint mobilization in the acute phase and only for a duration of 2 weeks. This is in direct conflict with the data presented in our section 1 of this chapter, i.e., from 128 RCTs, patients are only 45% improved in 8.1 visits.

Recall, in most Canadian Provinces and USA States, that PTs are not primary care physicians and thus are directed by MD prescriptions. These MD Physiatrists state, "It is important for the physical therapist to document the patient's progress so that the physician can modify the care plan, if needed. This documentation is typically given to the physician every 30 days or before the patient sees the physician for a follow-up visit." They also had a definition of some common types of exercises which are repeated in Table 34.

Table 34
Common Therapeutic Exercises

Exercise Type	Description	Therapeutic Use
Closed kinetic chain	Proximal segment of the extremity moves on a fixed distal segment (e.g., leg press, squats, elliptical walker)	Shoulder and knee rehabilitation, dynamic stability
Concentric	Muscle contracts as it shortens (e.g., flexion phase of a biceps or hamstring curl)	Increase muscle mass and strength
Core stability	Targets low back, trunk, and abdominal muscles (e.g., sit-up, back extension, abdominal crunch, Pilates)	Relief of low back pain or pregnancy-related pelvic pain
Eccentric	Muscle contracts as it lengthens (e.g., extension phase of a biceps or hamstring curl)	Sport-specific strengthening to prevent injury
Isometric	Muscle contracts, but its length stays the same (e.g., holding a weight in a stationary position for a few seconds)	Muscle toning and strengthening when joint mobility is not advised; quadriceps exercises to treat patellofemoral pain syndrome
Isotonic	Constant resistance applied to a muscle through a joint range of motion (e.g., free-weight lifting)	General muscle conditioning
Open kinetic chain	Distal segment of the extremity moves about the proximal segment (e.g., long arc quadriceps extension, most weight-lifting exercises using the arms)	Functional improvement in activities of daily living

Table 35

Prescribing Physical Therapy for Musculoskeletal Injury

Healing Phase	Modality	Exercise	Manual Therapy	Frequency & Duration	Goals
Acute (<72 hrs)	Cold, electrical stimulation, pulsed ultrasound	Isometric, gentle active ROM	Gentle massage	Daily: 5 days	Decrease edema & pain, improve healing & ROM
Subacute (3-14 days)	Heat, electrical stimulation, low-level laser, iontophoresis	Isotonic, active ROM, stretching	Massage, joint mobilization	3 visits/wk for 2 weeks	Improve flexibility & function, increase muscle tone
Chronic (> 2 months)	TENS, continuous ultrasound	Strengthening, stabilization	Myofascial release	2 visits/week for 4 weeks	Functional improvements of daily living, restore normal tissue length

Functional Rehabilitation: Chiropractic Rehabilitation Association (CRA) Manual

The Chiropractic Rehabilitation Association (CRA) is a nonprofit organization composed of Chiropractors and was formed in 1988. It has published some frequency and duration guidelines.[622] CRA published a Manual in the 1990's, which had frequency and duration for exercise protocols, see Table 36.

Table 36

CRA's Protocols for Active Resistive Exercises[622]

Active Resistive Exercise	Method	Frequency	Duration
Isometric	Rule of Tens; Hettinger-Muller	Daily	4 weeks
Isotonic	Zinovieff, DeLorme-Watkin, McQueen, Progressive Resistive, Oxford, pyramid	a. 3-5 visits per week b. 2 visits per week	a. 7 weeks b. Until Pre-injury level, normative data, or normal physical demands
Isokinetic	Velocity-Spectrum, Pre-determined time, Submaximal, Customized	a. 3-5 visits per week b. 2 visits per week	a. 7 weeks b. Until Pre-injury level, normative data, or normal physical demands

From CRA's active exercise protocols in Table 36, note their beginning suggested programs of care are equivalent to the ICA's Program of Care #1 (approximately 25 visits in 8-11 weeks with examination and follow-ups added). Their additional program of 2 visits per week, based on patient

improvement or until, "Pre-injury level", would make CRA's programs quite similar to ICA's Programs #2-#6, depending on patient improvement.

While generally, Functional Rehabilitation methods do not have a goal of normalizing posture and/or normalizing spinal alignment as viewed on x-rays, Christensen[608] provides an exception since in 1991, he adopted all of Harrison's CBP® Mirror Image® Postural Exercises in his texts, in order to normalize subject's posture.

Structural Rehabilitation: Pettibon, ASBE, and CBP

The primary goals of Structural Rehabilitation methods are to normalize posture and/or normalize spinal alignment of x-ray. The secondary goals are the same as the primary goals in Functional Rehabilitation methods.

Critics of Structural Rehabilitation claim that there is no scientific definition of normal posture and/or normal spinal alignment; this claim is absolutely false. For the normal spinal model, Section V of the ICA's X-ray Guidelines, PCCRP,[623] demonstrates a biomechanical description of the normal spinal model with references to the literature.[624-630] These spinal models[624-630] are derived from averages of normal subjects and have been shown to have sensitivity and specificity in discriminating normal subjects from acute pain and chronic pain subjects. Figures 2 and 3 illustrate these normal structural alignments, which are goals of care in Structural Rehabilitation methods.

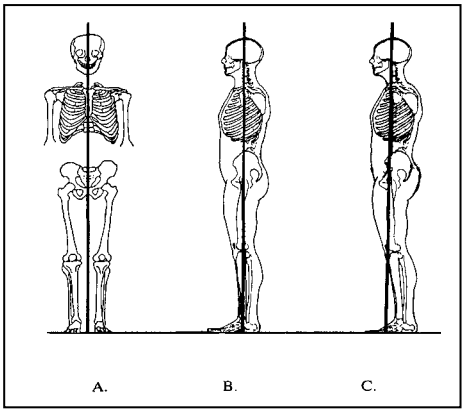

Figure 2
In A, the Normal postural alignment is depicted in the antero-posterior view. The centers of mass of the head, rib cage, and pelvis are aligned with mid knees and mid ankles. Inside this vertical alignment of centers of mass is the vertical alignment of the whole spine. In B the ideal sagittal posture is depicted as vertical alignment of the EAM, shoulder AC joint, hip joint, knee joint and maleolus of the ankle. In C, the average human sagittal alignment is shown. This alignment (C) has anterior head weight bearing, which has been shown to be associated with a myriad of axial pain syndromes and therefore, it is not considered normal.

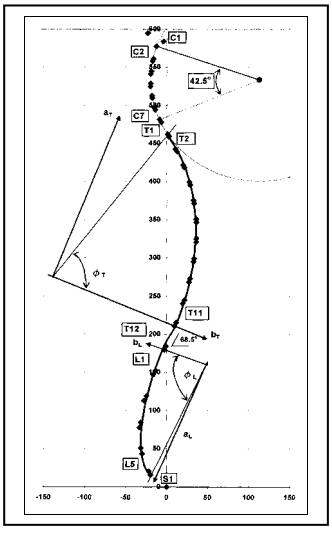

Figure 3
Since the normal spine is vertical in the AP view, it is only necessary to define the normal sagittal spinal alignment. Shown in this illustration are the posterior body corners of C1 through S1, which depicts the path of the Posterior Longitudinal Ligament (PLL). The Normal spinal alignment has a vertical sagittal balance of four vertebrae: posterior-superior C1 lateral mass, posterior-inferior T1 body, posterior-inferior T12 body, and posterior-inferior S1 body. Within spinal regions, the geometric shapes are a piece of a circle in the cervical spine, a piece of an ellipse in the thoracic spine, and a piece of an ellipse in the lumbar spine. The thoracic and lumbar ellipses are composed of different b/a ratios (b/a = ratio of minor axis to major axis). The angles of intersection of each posterior tangent (lines through each pair of posterior body points) create segmental angles and global angles in each region. These Normal segmental (between adjacent vertebrae) and global (C1 to C7, T2 to T11, and L1 to L5) sagittal angles have been reported in the literature.[624-630]

There are only a few Chiropractic Techniques that have Structural Rehabilitation methods and published scientific results. Some of these are Pettibon, ASBE (Applied Spinal Biomechanical Engineering), and CBP® (Clinical Biomechanics of Posture®, Chiropractic Biophysics®). ASBE, Pettibon, and CBP® use initial x-ray measurements to decide the exact taylor-made type of care to be given to each individual patient.

ASBE utilizes exercise maneuvers to reverse the spinal alignment measured on the pre x-rays. In 2001, Golembiewski and Catanzaro reported on a Case Study of a 28-year-old female, whose scoliosis was reduced, using Cobb angle analysis, with ASBE procedures.[613] The patient repeated the ASBE cross-over exercises daily for 5 months.

Pettibon Technique procedures include some types of cervical traction and applications of weight to the forehead and shoulders to cause muscle pull toward normal posture and normal spinal alignment. Moringstar[631-634] has reported on scoliosis improvement with the Pettibon Technique procedures. In 2007, four cases of scoliosis were treated with bracing, a patented weighting system, vibration therapy, and manual traction procedures.[631] The evaluation process consisted of multiple outcomes, including radiographic, functional, respiratory, and postural assessments. Patients were evaluated at the onset of treatment and after 90 days. All 4 patients saw their major curvatures reduced an average of 13.5°. Peak expiratory flow, computerized postural assessment, chest expansion, rib hump measurements, and functional rating index scores also improved for all patients.[631]

In 2006, Morningstar and Joy[632] reported on 3 atypical cases of scoliosis. Each patient was treated with a novel active rehabilitation program for varying lengths of time, including spinal manipulation and a patented external head and body weighting system. Following a course of treatment, consisting of clinic and home care treatments, post-treatment radiographs and examinations were conducted. Improvement in symptoms and daily function was obtained in all 3 cases. Concerning Cobb angle measurements, there was a reduction in Cobb angle of 13 degrees, 8 degrees, and 16 degrees, respectively, over 12 weeks of treatment.[632] In 2004, Morningstar et al.[633] reported on 19 scoliosis patients. Antero-posterior radiographs were taken of each subject prior to treatment intervention and 4-6 weeks following the intervention. After 4-6 weeks of treatment, the treatment group averaged a 17 degrees reduction in their Cobb angle measurements. None of the patients' Cobb angles increased.[634]

In 2003, Saunders et al[635] reported on a case series of 131 patients with loss of the cervical curve. Head weights were applied to the foreheads of the subjects and pre- and post-lateral cervical views were obtained. The patients only wore the head weight for 20 minutes before a post x-ray was obtained. Unfortunately, their results are not clinically relevant because they took the post x-ray with the head weight still on the subjects' forehead, thus giving a false amount of improvement from treatment.[635]

In a series of articles in the Journal of Chiropractic Medicine,[636-638] Morningstar et. al. reported on cervical curve changes and improvements in thoracic pain with Pettibon head weighting.

In 2006, Harrison et. al.[639] reported on a Case Series of 6 scoliosis patients using the Non-Communitivity Property of Finite Rotation Angles. After an average of 54 visits in 18 weeks, there was a reduction in the lumbar apex Risser-Ferguson angle (25º reduced to 14º) and Cobb Angle of the lumbar scoliosis. From 1994-2004, Harrison et. al. published 5 non-randomized clinical control trials.[157-161,617] Three involved improvements of loss of the cervical lordosis, 1 involved loss of the lumbar lordosis, 1 involved lateral head translation displacements, and 1 concerned lateral trunk translations (trunk list). Harrison et. al. have published numerous case studies and case series.[639-646]

Except for a few instances in the 23 studies in Table 36, the published Structural Rehabilitation programs are quite similar to ICA's Frequency and Duration Programs #1, #2, #3, or #4. It is also interesting to note that Pettibon, ASBE, and CBP Techniques have had some very good results in reducing idiopathic scoliosis. Additionally, Pettibon and CBP Techniques have had good results in re-establishing the sagittal spinal curves into lordosis, kyphosis, and lordosis for the cervical, thoracic, and lumbar regions, respectively.

Table 36
Frequency and Duration for Chiropractic Techniques that have Structural Rehabilitation Methods

Technique, year, author	Study Type	Condition	# patients	Clinical Outcome	Frequency & Duration*
ASBE, 2001 Golembieqski	Case Study	Scoliosis	1	Cobb angle reduced	Daily for 5 months
Pettibon, 2007 Morningstar[631]	Case Series	Scoliosis	4	Cobb angle reduced: 13.5º	3 visits per week for 12 weeks
Pettibon, 2006 Morningstar[632]	Case Series	Scoliosis: Thoracic	3	Cobb angle reduced: 13º, 8º, 16º	3 visits per week for 12 weeks
Pettibon, 2004 Morningstar[633]	Cohort	Scoliosis	19	Cobb angle reduced 17º: Average Cobb: 28º down to 11º	3 visits per week for 4-6 weeks
Pettibon, 2004, Morningstar[634]	Case Study	Scoliosis: Thoraco-lumbar	1	Cobb Angles; 35º to 20º	2 visits per week for 6 weeks
Pettibon, 2003, Saunders[635]	Cohort	Loss of Cervical Lordosis	131	Unknown, since post x-ray was taken with Head weight still on	1 visit in 1 day
Pettibon, 2002, Morningstar[636]	Case Study	Loss of Cervical Lordosis	1	S-curve: 3º-kyphosis & 20º lord. corrected to 36º lordosis	30 visits in 8 weeks
Pettibon, 2003, Morningstar[637]	Case Study	Loss of Cervical Lordosis	15	Unknown, since post x-ray was taken with Head weight still on	1 visit in 1 day
Pettibon, 2003, Morningstar[638]	Case Study	Loss of Cervical Lordosis	1	Hyper-lordosis of 52º corrected to 40º, +TzH: 15 mm to 12mm	10 visits in 24 days
CBP, 2006 Harrison	Case Series	Scoliosis	6	Risser-Ferguson: 25º to 14º Cobb angle reduced 38º to 21º	54 visits in 18 weeks
CBP, 1994, Harrison	Non-random Clin Trial	Loss of Cervical Lordosis	35	C2-C7 angle improved 13.2º	60 visits in 3 months
CBP, 2002, Harrison	Non-random Clin Trial	Loss of Cervical Lordosis	30	C2-C7 angle improved 14º	35 visits in 3 months
CBP, 2002, Harrison	Non-random Clin Trial	Loss of Cervical Lordosis	30	C2-C7 angle improved 18º	38 visits in 3 months
CBP, 2003, Harrison	Non-random Clin Trial	Loss of Lumbar Lordosis	48	L1-L5 angle improved 11º	38 visits in 3 months
CBP, 2003, Harrison	Non-random Clin Trial	Lateral Head Translation	51	TxH distance improved 50%	37 visits in 3 months
CBP, 2004, Harrison	Non-random Clin Trial	Lateral Trunk Translation	63	TxT distance improved 50%	36 visits in 3 months
CBP, 2005, Ferrantelli	Case Study	WAD, cervical kyphosis	1	Improved from 3º kyphosis to 22º lordosis	64 visits in 9 months
CBP, 2004, Bastecki	Case Study	ADHD, cervical kyphosis	1	Improved from 12º kyphosis to 32º lordosis	35 visits in 8 weeks
CBP, 2004, Paulk	Case Study	Herniation, loss of lordosis,retro	1	Improved L1-L5: 25º to 36º, L5 retro reduced	53 visits in 4.5 months
CBP, 2005, Haas	Case Study	Loss of lordosis, Syrinx	1	Cervical lordosis increased from 10º to 30º	26 visits in 3 weeks
CBP, 2007, Berry	Case Study	Loss of lordosis, anterior head	1	Cervical lordosis increased: 19º to 32º, AHW: 47mm to 36mm	84 visits in 7 months
CBP, 2005, Oakley	Case Study	Lateral head translation	1	Lateral head translation reduced 28mm to 13mm	25 visits in 11 days
CBP, 2002, Harrison	Case Series	Flat back	3	Average L1-L5 improvement: 31º,	Aver: 66 Visits in 45 weeks

To complete this, Chapter 11, some results on maintenance care, stabilization care, and wellness care will now be presented.

X. Wellness, Maintenance, Stabilization Care

Often Chiropractors suggest a care program after an intensive care plan has been completed. For example, of a year long program of care, a Frequency and Duration protocol of 6 months intensive care can be augmented with a stability care regime of once weekly for 3 months and twice per month for 3 months, or variations of this. Many would term this augmented care as, "Maintenance care", but if the clinician is obtaining post-examination information, then the clinician is looking for, "stability", of the patient's condition. Thus, a better term is, "Stability Care". We differentiate, "Stability Care", from, "Maintenance Care", by whether or not the clinician is just providing palliative visits at a frequency of one per month (Maintenance care) or whether he/she is actively obtaining follow-up data with physical examinations, health status questionnaires, pain scores, and radiographic comparisons to determine if the patient is relapsing.

There is some published evidence to support, "Stability", and "Maintenance" Care.[647-654] From a survey filled out by practicing chiropractors (658 out of 1500 responded). Rupert reported chiropractors agreed maintenance care was to optimize health (90%), prevent conditions from developing (89%), provide palliative care (86%), and to minimize recurrences or exacerbations (95%).[647] The therapeutic composition of maintenance care placed equal weight on exercise (96%) and adjustments/SMT (97%), and included lifestyle changes (84%) and dietary recommendations (93%).[647] The average number of maintenance visits was 14.4 per year, or approximately one visit per month.[647]

In 2000, Rupert et al[648] reported on a descriptive study of subjects, who were 65 years old or more. They selected chiropractic patients who had received maintenance care (health promotion and prevention services) for at least 5 years. A total of 73 chiropractors enrolled 10 patients each in this study. On average, patients received 1.9 manual procedures per visit, stretching (68.2%), aerobic exercises (55.6%), dietary advice (45.3%), and many other prevention strategies. Compared to the national average of 9 visits to medical providers per year, these, "maintenance", chiropractic patients averaged only half of that (4.76).[648] To compare for overall health status, patients in the study were asked to complete a general health survey. The survey method used was the SF-36D, and a supplemental questionnaire. The SF-36D gives the overall health status index of a patient, and further breaks down 3 primary attributes: functional status, well-being, and overall evaluation of health. Normative data exists for 1,814 US patients over 65 years of age, who did not receive preventive chiropractic services. The SF-36D scores of the chiropractic patients were not significantly different from the normative data scores. Despite similar health status, chiropractic patients, when compared with US citizens of the same age, spent only 31% the national average per-person expendatures for health care services! Furthermore, 95.8% of the patients receiving five years or more of maintenance chiropractic care believed it to be either considerably or extremely valuable.[648]

In terms of cost savings from not-needed medical care, the Rupert et al studies[647-648] and a study by Coulter et al[649] have shown older subjects, who had maintenance chiropractic care, have less nursing home usage, less hospitalizations, were more likely to report a higher health status, exercised more often and more vigorously, and had fewer total healthcare interventions.

Coulter, [649] while analyzing an insurance database, compared 23 persons over 75 years of age receiving chiropractic care with 414 non-chiropractic patients. While 45% of Medicare's $278 Billion expenditures in 2003 were for hospital coverage,[650] the chiropractic patients reported 21% less time in hospitals over the previous 3 years.[650]

In 2004, Descarreaux et. al.[651] reported on a study of 30 chronic low back pain subjects. The 30 subjects were split into two groups. Group 1 had 12 visits in one month and no additional visits, while group 2 had 12 visits in one month and then received a maintenance SMT visit every 3 weeks

for 9 months (12 visits more). Both groups maintained their pain levels at long-term follow-up, but only group 2 maintained their disability scores at long-term follow-up. The disability scores of group 1 subjects returned back to their pretreatment levels at long-term follow-up.[651]

In 2005, Wenban and Nielsen[652] presented a case report of chronic low back pain in which a 26 year-old female patient received initial intensive chiropractic care and maintenance care. The patient continued to improve over the course of 9 months of maintenance care. For initial and follow-up documentation, they used SF-36 (pre 23.4, post exams of 25.3, 43.7, & 62.8), Quality of Well-Being Scale (pre 1.1, post 8.2), VAS (pre 8, post 1.5), and the number of tender vertebral spinous processes.[652]

A study by Muse & Associates[653] examined the utilization, cost and effects of chiropractic services on Medicare program costs compared to similar data for beneficiaries treated by other provider types. The number of beneficiaries included numbered 5.8 M. 1.5 M (26.8%) received chiropractic care. Despite averaging more claims per capita than non-chiropractic patients, beneficiaries who received chiropractic care had lower average Medicare payments per capita for all Medicare services ($4,426 vs. $8,103), and had lower average payments per claim for Medicare services ($133 vs. $210). Aside from high levels of patient satisfaction and improved health behaviors, senior citizens receiving chiropractic care spent significantly less time in hospitals, reduced medical utilization, and spent much less on medical care than persons receiving chiropractic care.[653]

Contrary to the whims of 3rd party payers, who wish to maximize profits by denying chiropractic Stabilization and/or Maintenance Care, these seven studies,[647-653] taken together, indicate health status is maintained or improved with maintenance/stability care, while subjects not receiving maintenance care return to pre-treatment disabilities.

Recently in 2005, Mootz et al[654] reported on a survey of Chiropractors, from which data for 2550 chiropractic patient visits were recorded. Care for low back, head and neck pain accounted for almost three quarters of visits. Extremity conditions and wellness care accounted for approximately half of the remaining visits. Spinal and soft tissue examinations were the most frequently reported diagnostic procedures (80% and 56% of visits, respectively), and high-velocity spinal manipulation techniques were the most frequently reported therapeutic procedures (almost 85% of visits). Rehabilitation exercises, thermal modalities, electric stimulation, and counseling/education/self-care were each performed during approximately 25% of visits.[654]

While it seems quite logical that proper diet, strength exercises, aerobic exercise, routine Chiropractic care, proper-positive mental attitude, and social wellbeing are essential to have a full and long life span, there are many theories with promising evidence-based support, but very few long term studies to cite. While most healthcare providers believe some of these items to be essential, we await the publication of such studies.

Summary

This Chapter presented the ICA's Practice Guidelines, which are in actuality Programs of Frequency and Duration. There were a Basic ICA Program of care (25 visits in 8 weeks) and 5 additional ICA Programs of Care based on complicating factors and patient progress at follow-up examinations. These programs were based on pain data from 128 RCTs and are evidence-based. This is in contrast to the many other guidelines, which are cited within this document, but were personal opinions or created by 3rd parties to reduce claims and increase profits.

There are a multitude of professions that have published guidelines, many without frequency and duration suggestions, but with a wealth of information. For Medical guidelines, see http://medicine.ucsf.edu/resources/guidelines/sites.html, and for Chiropractic guidelines, see www.gfmer.ch/TMCAM/Chiropractic/Chiropractic_mt.htm

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