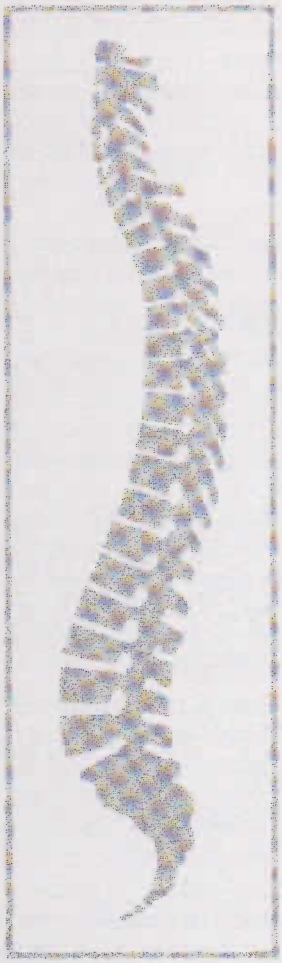

THE CHIROPRACTIC REPORT

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Chiropractic Research in the Centennial Year - Part I

Neuromusculoskeletal

A. Introduction

1. The famous edict, 'publish or perish', has never been more true than now. And as 1994 closes, and the chiropractic profession enters its centennial year, there has been an explosion of important chiropractic research worldwide as never before.

This is both neuromusculoskeletal, which is seen as of greatest importance by payors/consumers of chiropractic care, and somatovisceral, which is of dearest interest to many chiropractors as it addresses the central hypotheses of their profession. Chiropractors have long awaited the day, now here, on which they would have the resources to be running major interdisciplinary trials not only on back pain, neck pain and headache, but also on management of childhood asthma (two - one in the US and one in Canada), colic, dysmenorrhoea, hypertension and otitis media all at the same time.

Research is worldwide and at all levels - for example on epidemiology, on answering unresolved basic science questions about normal and abnormal vertebral movement and precise measurement of biomechanical and neurological change, and clinical studies and trials to show the results of chiropractic care.

All this is possible because in many countries there is an exciting new level of external funding (government and private sector) and interdisciplinary cooperation and enthusiasm for chiropractic research. These things have been solidly earned by the profession and are the rewards of 20 years of:

- Establishing and funding research foundations such as the Consortium for Chiropractic Research and the Foundation for Chiropractic Education and Research (USA), the Chiropractic Foundation for Spinal Research (Canada), the Australian Spinal Research Foundation and the European Chiropractors' Union Professional Council.
- Through these foundations, funding chiropractors to pursue PhDs in related disciplines - this has created the corps of researchers needed.
- Providing funds for initial trials and pilot studies. As the examples below will show, $50,000 for a pilot study leads to the grants of $250,000 or $1 million from external sources for the big trials.

Many field chiropractors are unaware of the excitement and importance of this work. Accordingly this Report presents a review - this issue looks at neuromusculoskeletal research including headache, and the next (Part II, January 1995) will look at the somatovisceral research.

B. Low-back Pain

Clinical Trials

2. In the US there are several major trials and studies, two just completed. These reflect new strengths in research methodology, and new levels of government funding and interdisciplinary cooperation.

3. **National College of Chiropractic, Chicago** (*Principal Investigators:* John Triano MA DC and Marion MacGregor DC MSc). This is a randomized controlled trial with 209 chronic low-back patients that is now completed and accepted for publication in *Spine*. Patients were randomly assigned to three comparison groups, one receiving chiropractic adjustment/manipulation, a control group receiving low-force mobilization, and a second control group receiving only education.

There were 11 treatments/visits over 3 weeks with results measured in terms of pain (VAS) and disability (Oswestry Questionnaire) after treatment and at 2 weeks follow-up. Preliminary results reported at scientific meetings have been encouraging. When published next year this will be the largest and most thorough controlled trial of any form of manipula-

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1995 Centennial Celebrations: *Canada:* May 31 to June 4, Toronto, Ontario. Information: (416) 781-5656. *United States:* July 5-10, 1995, Washington DC (incorporating the 1995 World Chiropractic Congress) and September 13-17, 1995, Davenport Iowa. Registrations: 1-800-324-1995.

Professional Notes

US Armed Forces Commence Chiropractic Demonstration Project

Under measures recently passed by the US Senate and House the Secretary of Defense has been directed to implement a 3 year 'Chiropractic Health Care Demonstration Program' in "not less than 10 major military medical treatment facilities" during 1995 to 1997.

Other requirements include:

- Appointment of an Oversight Committee to assist in design and evaluation of the program. This Committee, to be appointed in the next 30 days, is to have at least four representatives of the chiropractic profession, and representatives of the Surgeons General of the Army, the Air Force and the Navy. Prominent chiropractic leaders, including Reed Phillips DC PhD, President, Los Angeles College of Chiropractic, have already been asked to serve.
- Selection of the treatment facilities and an outline report of the program to the Committees on Armed Forces of the Senate and the House by January 30, 1995.
- A full report on the developed program by May 1, 1995.

The demonstration program will make government funded chiropractic care available to the military in non-combat situations, and will evaluate benefits in that setting. If chiropractic health care is found to be beneficial that will lead to a permanent program and chiropractic services in combat situations.

tion published in North America, and the first chiropractic trial published in *Spine*.

4. **Northwestern College of Chiropractic, Minneapolis** (*Principal Investigator:* Gert Brontford DC). Another randomized controlled trial for chronic low-back pain patients (n 174) now completed. This trial is interdisciplinary and compares three treatment approaches:

- Chiropractic adjustment/manipulation together with a dynamic trunk strengthening exercise program.
- Chiropractic adjustment/manipulation together with a stretching exercise program.
- Medical therapy (NSAIDS) with a dynamic trunk strengthening exercise program.

Results (outcomes) have been measured subjectively (disability and pain questionnaires) and objectively (lumbar spinal range of motion and trunk muscle strength and endurance), and also in terms of use of analgesics and work status. They are presently being processed.

5. **Palmer College of Chiropractic West, San Jose** (*Principal Investigator:* William Meeker DC, MPH). This third major back pain trial is also interdisciplinary, is large (n 300), and focuses specifically on patients injured in industrial accidents. The three treatments compared are spinal adjustment/manipulation; conservative treatment - including patient involvement in conditioning, training and cognitive therapy; and a combination of both the above.

Patients are being seen an average 2.5 times per week for 8 weeks with results measured subjectively (VAS, Oswestry, McGill Pain Questionnaire, Deyo Patient Satisfaction Questionnaire), objectively (range of motion by inclinometer), and in terms of cost. Results from this trial, which commenced in 1992 at a cost of approximately $400,000, will be available during 1995.

6. **Center for Health Studies, Seattle** (*Principal Investigator:* Daniel Cherkin PhD). On a federal grant of $980,000 Cherkin, a prominent researcher and epidemiologist in the field of low-back pain, is comparing three treatments in 350 patients with acute low-back pain:

- Chiropractic adjustment/manipulation
- The McKenzie method of patient self-administered mechanical therapy.
- Conservative medical care - rest, medication, general physical therapy.

Treatment is over one month with results measured subjectively (pain and disability and patient satisfaction instruments), objectively and in terms of cost. Initial assessment is at 1 and 4 weeks, with follow-up at 3 months and one year. Results will be available in 1996.

7. **Los Angeles College of Chiropractic and the University of California, Los Angeles** (*Principal Investigators:* John Hsieh DC PT, LACC and Jerome Tobis MD). This project is of high significance because of its goals, practical consequences and new level of interdisciplinary cooperation and external funding. On a federal grant to LACC from the US Department of Health and Human Services of $963,000, LACC and the Department of Physical Medicine and Rehabilitation, Irvine College of Medicine, U of C, are collaborating on a study titled '*Manual Therapy in the Management of Low Back Syndromes with Myofascial and Articular Dysfunction*'.

The study, which commenced this month and will take 3 years, includes a randomized controlled trial comparing the effectiveness and cost-effectiveness of chiropractic and medical management of mechanical low-back pain (LBP) patients. Chiropractic management will combine joint adjustment/manipulation and specific myofascial pain therapy. Other goals include:

- Examination of the inter-examiner reliability of manual examination of trigger points and articular dysfunction.
- Investigation of the prevalence of the trigger points, articular dysfunction and motion asymmetry in mechanical LBP patients.
- Provision of information on how and why patients select medical or chiropractic care.

Additional funding comes from FCER and Leander. Tobis is author of the 1986 text '*Musculoskeletal Manipulation: Evaluation of the Scientific Evidence*'[2] and a colleague of Scott Haldeman DC MD PhD, Associate Clinical Professor at Irvine.

8. **Western States Chiropractic College, Portland and Oregon Health Sciences University, Department of Family Medicine** (*Principal Investigators:* Joanne Nyiendo PhD and Mitchell Haas DC, WSCC, and Bruce Goldberg MD OHSU - DFM.

Finally there is the ground-breaking new study led by Joanne Nyiendo, Director of Research, WSCC, which commenced in September 1994 after 3 years of detailed preparation. The feasibility study was funded by the profession (FCER and NICR) but the main project has $800,000 in federal funding.

- Over a period of 12 months 60 chiropractors and 111 primary care MDs (77 community-based and 34 university-based) will enter 4,352 low-back pain patients in a prospective, practice-based study - not a controlled trial.
- Patient results will be assessed over a 12 months follow-up period, both as to back pain and disability (VAS, Oswestry and TyPE Spec) and general health status (SF - 36D Questionnaire).

The objectives of the project are much wider than just measurement of outcomes. They include the first detailed and wide-ranging description of the management of low-back pain patients in medical and chiropractic primary practice. Data will be obtained on factors affecting provider choice, socio-demographics, diagnostic classification, and on characteristics of treatment for initial episode (including frequency and duration of treatment, and patient satisfaction) and on cost.

Chiropractic management will also be evaluated with respect to type and region of adjustment and use of ancillary procedures. Medical management will be assessed both as to primary treatments offered and, where there is referral, nature,

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frequency and duration of referred services provided - for example by a physical therapist.

9. Internationally there are a number of other smaller but significant low-back pain studies and trials underway. The other large trial, funded by the British construction industry, is that now being commenced by Alan Breen DC PhD and colleagues at the Anglo-European College of Chiropractic (AECC) in England (see para 14).

Basic Sciences

10. Although clinical trials command the most attention, many of the basic science questions that need to be answered to improve the quality of these trials remain poorly answered. This is true not only in the field of physical treatments for patients with low-back pain but also most other areas of the health sciences.

Accordingly it is exciting to report that there is much groundbreaking work underway in the basic sciences - methods of measuring pain, measuring range of motion, classifying back pain patients, discovering exactly what happens in terms of forces and biomechanics when chiropractors deliver a specific form of adjustment or use flexion/distraction. There is insufficient room here to list, let alone discuss, the collaborative work underway in chiropractic colleges and universities around the world. The following examples give an idea of the sophistication and range of the research.

11. Digitised Videofluoroscopy (DVF).

Can spinal movements be quantified objectively? What is normal movement? To what degree does an adjustment alter abnormal movement - at the level of the adjustment and at other spinal levels?

These fundamental questions have yet to be resolved. Answers are now much closer following eight years of collaborative research at AECC and the Department of Mechanical Engineering, University of Southampton in England. Principal researchers are Alan Breen DC PhD and Michael Kondracki DC MSc at AECC, and Robert Allen PhD at the University of Southampton. Original funding was from the European Chiropractors' Union but at present major funding is from the Henry Smith Charity, an external private research foundation. It is noted:

a) The project combines sophisticated bio-engineering and chiropractic clinical expertise to analyze vertebral movements in great detail. Low dose motion xray images are digitised by computer, allowing analysis for example of:

- *Laxity* of the intervertebral holding elements - i.e. the sort of abnormal movement/sliding a chiropractor feels subjectively as hypermobility on motion palpation.
- *Synchronicity* of movement - the relationship between all segments in a spinal region, and whether they share a movement equally.
- *Regularity* - do the segments move smoothly/regularly over time during a movement, or is there irregularity or even oscillation.

b) The early years in this ambitious project involved system development and validation, choice of movements to measure (indices), and description of normal ranges. Papers on this work have appeared in the biomechanics literature (e.g. Journal of Biomechanical Engineering, Clinical Biomechanics).

c) Current work is not validation - the system is widely accepted and now in demand in Britain for assessment of problem back pain patients - but is further improvement of the software for ease of use in clinical and research settings.

Clinically DVF will be a special imaging tool like MRI, available on referral and identifying patients suitable for spinal fusion and later identifying whether fusion has been successful.

DVF has huge potential for chiropractic as a research tool, because it can accurately and objectively identify normal and abnormal spinal movements and the effects of specific methods of adjustment and other chiropractic treatments.

12. Biomechanics of Flexion/Distraction

The third most common technique used by doctors of chiropractic in the US for treatment of back pain is flexion/distraction.[2] As with most interventions, no one has established exactly what happens. One accepted hypothesis is that foraminal space is increased, freeing the spinal nerve root and ganglion from irritation or compression. Lynton Giles DC PhD has shown how these neural elements may be compromised at the intervertebral foramen,[3] and Gregory Cramer DC PhD has identified a reliable method of measurement of the size of the foramen.[4]

Now it is time to document exactly what happens at the foramen during flexion/distraction. With a US federal government grant of $300,000 this work is underway in Chicago in a collaborative project between the National College of Chiropractic (Ram Gudavalli PhD and James Cox DC DACBR) and Stritch School of Medicine, Loyola University, (Pat Warden PhD). This three year study has two parts:

a) Measurement of biomechanical events during flexion/extraction using cadavers.

b) Measurements using back pain patients from the Department of Orthopedic Surgery at Loyola.

A comparison will answer related questions such as how movement changes with live subjects, how pain affects the musculature, and how this influences biomechanics during flexion/distraction.

13. Signal Detection Theory - Pain Measurement

At the Department of Physiology, Faculty of Medicine, Auckland University, New Zealand, FCER Fellow Bernadette Murphy DC is completing a PhD in neurophysiology by developing a new method of measuring pain. Her research group has shown that traditional methods, which measure pain *thresholds* are biased and inaccurate - they cannot discriminate for factors such as anxiety and apprehension. Her new method, based on 'signal detection theory' employs a more sophisticated measure - the effect of a stimulus on the 'density' of the constant ongoing activity in the sensory system. This measurement does discriminate, allowing for an objective index of potentially noxious stimuli. Her work will be clinically important in a number of areas including assessment of the effects of repetitive motion and the psychosocial component of pain in chronic pain patients.

14. Classification of Back Pain

The highly regarded British Medical Research Council trial by Meade et al in England reported in 1990 that chiropractic manipulation was highly effective with long-term benefit for adult patients with mechanical low-back pain - both acute (short term pain) and chronic (more than 1 month or a history of back pain).[5]

But what is chronic low-back pain? What is acute, sub-acute? Within chiropractic, medicine and other health disciplines, and across those disciplines, numerous diagnostic labels are used and

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there is poor agreement on what they mean. Much good research is underway here, for example:

a) *Switzerland.* In Geneva Jean Robert DC, Director, Swiss Chiropractic Institute for Advanced Studies, is one of the investigators in a multi-disciplinary government funded study of chronic occupational low-back pain. Over four years at a cost of $4 million there has been study of many issues including a comparison of workers' compensation and private patients, and the effectiveness of back school in industry - found, in this large national study, to be of little value. The report of this project is to be published as a monograph in January 1995.

Perhaps the most fundamental conclusion, however, is that the whole concept of chronic pain as often defined (pain for more than 3 months, or more than 4 episodes in the past 12 months) is unhelpful and needs revision because there is such immense variation of patients within that label. In essence the patients have more differences than similarities.

b) *England.* Jennifer Langworthy from AECC is completing a doctoral thesis on back pain classification at the University of Southampton. During the past 3 years, in important new work funded by FCER and the British National Back Pain Association, she has examined 3 groups of 100 patients - 2 receiving chiropractic treatment at AECC clinics, and one group medical treatment in a hospital orthopedic department. Her work suggests:

- Most current diagnostic labels are not used in a standard or helpful way, and prevent cross-disciplinary understanding, referral and cooperation. They should be replaced by a new classification that is relevant, easy to use in practice and cross-disciplinary.
- The proposed system should focus on variables such as aggravating and relieving mechanical factors, and daily cycle (e.g. pain worse in the morning). For example some back pain patients report their pain aggravated by sitting, relieved by walking. Others are relieved by standing and some of these are worse in the morning. These are combinations that all professionals can understand. They provide a better basis for clinical practice and research.

As positive proof that this is of major interest to industry in England, the Laing Foundation (construction industry) is now funding a major new clinical study by Breen, Langworthy and Bolton based on these classifications, and it is noted:

i) The pilot study commenced in July 1994. The main study will be similar in size (n 800) and treatment protocol to the Meade et al trial.

ii) All patients, however, will receive chiropractic management. But they will be put into groups based on Langworthy's classification of back pain to see which sub-groups of patients do best. Results will be measured subjectively (VAS, Oswestry, global appreciation of improvement) and objectively (straight leg raise, and Main psychometric measures).

Epidemiology and Demography

15. The epidemiology of back pain, or the study of its frequency and distribution in the population and related factors, still has many gaps of knowledge - generally and with respect to chiropractic practice. Demographic research tells us who sees health professionals and what happens. Some of the studies already discussed involve demographic research. A wealth of other work is underway including:

a) *Adolescent Low Back Pain (ALBP).* This is the specialized field of research for Phillip Ebrall MAppSci (Chiro), Director, Australian Centre for Chiropractic Research, RMIT University, Melbourne, who is currently completing his PhD as an FCER Fellow.

In the first of several studies Ebrall has reported that, in a population of 610 males aged 12-19 attending three suburban schools in Australia:

i) 16.7% were currently experiencing low-back pain.

ii) 57% had experienced low-back pain (current or past)

iii) "The typical sufferer of ALBP reported chronic LBP experienced up to a few days at a time, several times a month."[6]

This confirms former chiropractic and medical studies, studies that have led to the conclusion in the American Journal of Public Health that ALBP is "a serious public health problem."[7]

b) *RAND Field Study.* Spinal manipulation has been shown to be appropriate[8] and effective[9] for most low-back pain patients - a simple statement of immense significance to chiropractic that could not have been made 10 years ago. This position is confirmed in multidisciplinary government-sponsored practice guidelines about to be released in the UK and the US.

But which categories of low-back pain patients do chiropractors see in practice, and how appropriately are they treated - what are real chiropractors in the field actually doing? These, and many other questions including patient satisfaction levels, are part of an extremely important field study by the RAND Corporation currently underway, on which:

i) The study, costing approximately $500,000 and funded principally by the American Chiropractic Association and NCMIC through FCER, is Part II of the RAND project commenced 5 years ago. (Part I involved a literature review, then multidisciplinary and chiropractic expert panels on the appropriateness of spinal manipulation for approximately 1,600 categories of low-back pain).

ii) It is being conducted on randomly chosen chiropracticpractices in the four census regions of the USA (and will therefore give results representative of chiropractic practice nationally in the US) and in the province of Ontario, Canada. Results will be reported in the second half of 1995.

C. Cervical Spine - Headache and Neck Pain

16. In this age of the automobile and stress effective management of cervical spine disorders, always of central significance to chiropractic practice, is even more important. Here also there is a wealth of research underway.

Headache

17. Next month Niels Nilsson DC MD, former Deputy Principal, AECC, files his PhD thesis at the University of Odense, Denmark. Its subject is cervicogenic headache (CGH), and it represents an integrated line of research of great interest. Funding of $300,000 has been from the Danish National Health Service and the European Chiropractors' Union. Notable features of Nilsson's work are:

a) *Prevalence Study.* One aspect has been a study of the prevalence (frequency) of CGH as defined by the International Headache Society in a random sample of 900 Danes representative of the general population of Denmark.[10] He finds that CGH is much more widespread than previously considered, about as prevalent as migraine.

This suggests, at the least, that CGH should be given as much attention - and research funding - as migraine. Even

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more importantly it supports the view of leading current medical researchers such as Otto Sjaastad, a Norwegian neurologist who is editor of the international journal of headache *Cephalalgia*, that most migraine has almost identical symptoms to CGH and should probably be diagnosed as CGH.[11]

b) *Defining Normal.* A second important part of Nilsson's work relates to:

- Improved reliability of measurement of cervical ranges of motion and muscle tenderness.
- A study using these measures and better defining normal ranges of motion in asymptomatic persons.

c) *Controlled Trial of Chiropractic Adjustment.* A third aspect, using this improved measurement of cervical spine function, has been a randomized controlled trial to assess the effectiveness of chiropractic adjustment (upper cervical - Palmer Toggle Recoil; lower cervical - Diversified) in the management of CGH.

Half of 38 patients were randomly assigned to chiropractic manipulation, and the other half formed a control group receiving massage and low-level laser therapy. Results of chiropractic management, currently submitted for publication during 1995, are understood to be encouraging.

18. Nilsson's work, like that of Breen and others, shows the importance of the relatively new phenomenon in chiropractic of having many chiropractic researchers complete PhDs in related disciplines. Instead of an isolated study in a given area such as CGH, a study that appears like a point of light in the sea of darkness, there is a consistent interest from an expert whose work will illuminate the area throughout his/her career. Basic science questions, that form the foundation for improved clinical research, are appreciated and studied.

19. The two major headache trials presently underway are:

a) ***Northwestern College of Chiropractic, Minneapolis*** *(Principal Investigators: Craig Nelson DC and Patrick Boline DC).* In this randomized controlled trial due for completion next month, 216 patients with a history of migraine headache have been sent for 1 of 3 treatments - chiropractic adjustment/manipulation; medical treatment with amitryptyline, a tricyclate antidepressant with evidence of effectiveness for prevention of migraine; and a combination of the chiropractic and medical treatments.

This is the first trial to compare a prescribed medication and chiropractic for the prevention and treatment of migraine headache. Results are being measured principally by pain ratings and headache frequency. Funding of $125,000 is from FCER.

b) ***RMIT University, Melbourne, Australia*** *(Principal Investigator: Wayne Whittingham MAppSci (Chiro)).* This is a controlled double-blind crossover study involving 100 patients and titled '*The Efficacy of Cervical Manipulation for Chronic Headaches and Upper Cervical Joint Dysfunction*'. It is investigating a specific toggle recoil technique and results should be available in the second half of 1995. Whittingham is an Australian Spinal Research Foundation Research Fellow, completing a PhD at RMIT University with this work.

Neck Pain

20. **University of Saskatchewan, Canada.** (*Principal Investigator:* David Cassidy DC PhD FCCS). In late 1993 Cassidy, Research Director, Department of Orthopaedics, Royal University Hospital, University of Saskatchewan, Saskatoon, received a grant of $1 million from the government automobile insurance plan to study whiplash injuries in the province of Saskatchewan over a five year period. This is the most comprehensive and exciting research underway in this field and highlights are:

a) At present, during the first year, there is a study of all motor vehicle accident victims in the province to gain basic data on whiplash/cervical soft tissue injuries - prevalence, nature, how treated, etc. During the final 4 years there are to be randomized controlled trials to determine the effectiveness and cost-effectiveness of chiropractic and other management.

b) Cassidy was chosen because of his research record and his membership on the Quebec Task Force on Whiplash Injuries which is currently reviewing the literature on treatment of the cervical spine in a similar manner to an earlier influential Quebec Task Force review of low-back pain. Another member of the present Quebec Task Force is Ake Nygren MD DDS PhD, who presently leads a large investigation into whiplash at the Karolinska Institute, Stockholm, Sweden. Nygren is Professor of Injury Prevention at the Institute, and Medical Director of Folksam Insurance, one of the largest insurers in Sweden.

All of this is of relevance because Nygren has received matching funding in Sweden to do sister studies in Europe to the work Cassidy is doing in North America. Their combined work, the most comprehensive worldwide, will provide important new evidence on the role of chiropractic management for neck pain and other symptoms of cervical whiplash injuries.

21. **Colorado Prevention Center, Denver** (*Principal Investigator:* John Sbarbaro MD). On a grant of $55,000 from FCER Sbarbaro is performing a pilot study to lay the groundwork for a definitive large scale randomized controlled trial to test the effectiveness of chiropractic adjustment/manipulation for patients with chronic cervical pain. The research question is whether or not short-term chiropractic manipulation will lead to better symptomatic and functional results than a low-cost structured program of rest for patients with uncomplicated chronic cervical spine pain.

In the pilot study, for which there will be results in 1995, there are 70 patients in two groups of 35, with treatment over a 6 week period. Primary measurements of results will be pain (character, intensity and effect on function) range of motion and overall health status. Outcomes will be measured not only following treatment but at 6 months to assess long-term results.

22. **Northwestern College of Chiropractic, Minneapolis**. (*Principal Investigator:* Gert Brontford DC). In progress is a randomized controlled trial with 189 patients comparing the effectiveness of three management approaches - chiropractic adjustment/manipulation and low-tech exercise; chiropractic adjustment/ manipulation and placebo modalities; and a MedX exercise regimen (i.e. high tech). Funding is from CCR and results are expected in 1995.

23. **RAND Appropriateness Study**. At its 1993 annual meeting the Consortium for Chiropractic Research (CCR) approved a

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study by the RAND Corporation on '*The Appropriateness of Manipulation for the Cervical Spine*'. This is similar to the important ongoing RAND appropriateness study for low-back pain, and is commencing with a literature review, then appropriateness ratings by all chiropractic and multidisciplinary panels of experts. Funding for this multi-year project will likely exceed $1 million. Principal investigators are William Meeker DC MPH, Dean of research, Palmer West and Alan Adams DC MS MPH from LACC.

24. **Basic Science Research**. Current work includes, e.g.:

a) Sophisticated new research on central projections of nerves from joints in the neck at the University of Newcastle, New South Wales, Australia by third generation chiropractor Philip Bolton DC PhD, funded by the profession through the Australian Spinal Research Foundation.

b) In Canadian research led by Francois Hains DC at the Canadian Memorial Chiropractic College, Toronto, further validation of the Neck Disability Index (NDI) first developed by Howard Vernon DC FCCS and Sil Mior DC FCCS. The NDI, a patient questionnaire that is the equivalent of the Oswestry Index for low-back pain patients, has been proven valid and reliable. In this research the original NDI will be compared with seven modified versions to gain a more sophisticated analysis and test what relationship, if any, there is between individual items on the NDI and pain scores on VAS.

D. Conclusion

25. The major problem with a review like this is the risk of offending many not mentioned, such as:

a) *Scoliosis*. Charles Lantz DC PhD at Life Chiropractic College West, San Lorenzo, California, who is investigating the results of chiropractic management of mild adolescent idiopathic scoliosis (10-20 degrees) as measured from xray (Cobb angles) and by METRECOM 3-D digitizer. This is a randomized controlled trial (n 100) in which chiropractic management includes full spine manual adjustments with particular attention to the apex, the pelvis, and the cervical spine, together with exercises, postural and lifestyle counselling and heel lifts where indicated. (FCER - $150,000).

b) *Carpal Tunnel Syndrome*. Thomas Davis DC and Kassem Kassek PhD MPH at Northwestern, who are performing an interdisciplinary randomized controlled trial to compare chiropractic (manipulation, ultrasound, 24 hour bracing) and medical (NSAIDS and 24 hour bracing) management. (FCER - $165,000).

c) *Biomechanics of the Adjustment*. Gregory Kawchuk DC, Phil Conway DC and Walter Hertzog PhD who are continuing their sophisticated research at the University of Calgary, Alberta, Canada on forces generated by different chiropractic manipulative techniques at different regions and levels in the spine; and Arlan Fuhr DC and colleagues at the National Institute for Chiropractic Research, Phoenix, Arizona, working in the same field.

d) *Neurophysiology*. James Hu PhD and Howard Vernon DC FCCS who are doing animal experiments at the University of Toronto to see if a natural opioid mechanism suppresses upper cervical pain conditions, thereby providing better understanding of pain mechanisms and the rationale for chiropractic treatment; or Scott Haldeman DC MD PhD developing a new electrophysiological profile to help diagnose spinal subluxation/dysfunction in back pain patients in a collaborative study by LACC, the University of California and Beijing Union Hospital in Beijing, China.

26. D.D. Palmer, B.J. Palmer, Dr. Claude Watkins, Dr. Joseph Janse and the other research pioneers in the chiropractic profession may rest assured that, 100 years on, chiropractic research is flourishing. Their descendants are indeed publishing, not perishing, and this is without doubt the best centennial gift the current generation can give.

In the next issue, this Report looks at the current somatovisceral research from basic science experiments in Japan to an array of major interdisciplinary clinical trials in North America

References

1. Tobis JS and Hoehler F (1986) '*Musculoskeletal Manipulation: Evaluation of the Scientific Evidence*', Charles C. Thomas, Springfield, Illinois.
2. '*Job Analysis of Chiropractic*' (1993), National Board of Chiropractic Examiners, Greeley, Colorado, 78.
3. Giles LGF (1994) '*A Histological Investigation of Human Lower Lumbar Intervertebral Canal (Foramen) Dimensions*', JMPT 17(1):4-14.
4. Cramer GD, Howe J et al (1994) '*Morphometric Comparison of Computed Tomography to Magnetic Resonance Imaging in the Evaluation of the Lumbar Intervertebral Foramina*', Clin Anatomy 7:173-180.
5. Meade TW, Dyer S et al (1990) '*Low-Back Pain of Mechanical Origin: A Randomised Comparison of Chiropractic and Hospital Outpatient Treatment*, 'BMJ 300:1431-37.
6. Ebrall PS (1994) '*The Epidemiology of Male Adolescent Low-Back Pain in a North Suburban Population of Melbourne, Australia*', JMPT 17(7):447-453.
7. Olsen TL, Anderson RL et al (1992) '*The Epidemiology of Low-Back Pain in an Adolescent Population*', Am J Public Health 82:606-608.
8. Shekelle PG, Adams AH et al (1991) '*The Appropriateness of Spinal Manipulation for Low Back Pain: Project Overview and Literature Review*', RAND, Santa Monica, California. Monograph No. R-4025/1 - CCR/FCER.
9. Manga P, Angus D et al (1993) '*The Effectiveness and Cost-Effectiveness of Chiropractic Management of Low-Back Pain*', Pran Manga and Associates, University of Ottawa, Canada.
10. For the IHS criteria for cervicogenic headache and a general discussion see *Chiropractic Management of Headache*, The Chiropractic Report, January 1991 (Vol 5 No. 2).
11. Sjaastad O et al (1986) '*Cervicogenic Headache, C_2 Rhizopathy, and Occipital Neuralgia: A Connection*', Cephalalgia 6:189-195.