The Chiropractic Report

www.chiropracticreport.com Editor: David Chapman-Smith LL.B. (Hons.) May 2010 Vol. 24 No. 3

Professional Notes

New Law in Israel

Many years of work by the Israeli Chiropractic Society (ICS) were rewarded on March 16 when the Israeli Knesset passed legislation to recognize and regulate the practice of chiropractic in Israel.

ICS President and Past-President, Dr. Pini Noyman and Dr. Shahar Kenin, report that the new law authorizes diagnosis and treatment as taught in accredited chiropractic educational programs, and that the existence of agreed international accreditation standards now adopted by the World Health Organization was an important factor in acceptance of the new law.

In Israel there are 90 graduates of accredited colleges who now qualify for licensure under the legislation. They serve a population of almost 7 million. Despite the previous absence of legal recognition many work in hospitals, publically funded health maintenance organizations and other clinics, and the military.

However the profession's public image has been damaged since the early 1990s

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Sports Chiropractic – Preventing Hamstring Injuries

A. Introduction

IN ALL CODES OF FOOTBALL, not to mention track and field and other sports, hamstring injuries are common and costly, and there is remarkably little published evidence on how to prevent or treat them.

For example they are the most prevalent injuries in Australian Rules football where at the elite level of the Australian Football League (AFL) hamstring injuries afflict 16% of players annually, causing 3.4 missed matches per injury.

These injuries account for more lost playing time than any other, and have the highest recurrence rate. Lower limb strains, often associated with hamstring injuries, are reported by 35% of players per season. The above injury rates have existed without improvement for the past 15 years.

Conventional injury prevention has focussed on local factors such as poor flexibility of the hamstring muscles, fatigue and lack of warm-up, rather than non-local factors typically addressed under chiropractic care – such as the biomechanics and postural control mechanisms of the lumbar spine and pelvis. However evidence supporting both local and non-local factors has been lacking.

Therefore the importance of a new randomized controlled trial (RCT) by Australian chiropractic researchers Wayne Hoskins, DC, PhD and Henry Pollard, DC, PhD[1] published in BMC Musculoskeletal Disorders last month. For the 2005 season for 60 players from two Australian Rules teams, normal best sports medicine care was compared with the same care plus chiropractic management.

There were very promising results from the addition of chiropractic care. This was in reduced hamstring injuries, lower limb muscle strains and non-contact knee injuries. There was also greatly reduced lost playing time for each of these injury categories. For example those in the chiropractic treatment group only missed 1 week of playing time due to non-contact knee injury, those in the control group lost 24 weeks. This has obvious and huge potential importance for professional sports teams and their star players.

A new Cochrane Collaboration review by British medical researchers Goldman and Jones titled *Interventions for Preventing Hamstring Injuries*[2], which assessed the study prior to publication, praises its design and internal and external validity, and concludes that it "points to a promising intervention" in a field where there is no proven approach to injury prevention.

There has been strong media attention. This study was done in Melbourne, the passionate home of Australian Rules. On April 18 the Sunday Age, a high circulation daily paper in Melbourne, printed the headline 'Study Finds Chiropractic Treatment Helps Cure Hamstrings', and reported recent injuries to star players and how this was the source of "constant frustration for clubs and players". It suggested that "AFL clubs could turn to a recent study on hamstring and lower limb muscle strains in a bid to reduce the number of players sidelined through the league's most common injury".

Since 2003 the foremost online source in Australia for information on professional sports injuries and what to do about them has been www.injuryupdate.com.au. It is produced for health professionals and all those interested in elite sports, and the leading medical contributor is John Orchard, MD, Injury Survey Coordinator for the AFL and Assistant Editor for the Journal of Medicine and Science in Sport.

Its headline was 'Research Shows Chi-

ropractic Reduces Soft-Tissue Injuries'. It praised this new research and encouraged a further and larger study "particularly as the results are important due to their potential for injury reduction, performance benefit and cost-saving practices for a relatively low cost intervention. Based on the findings of this study due consideration should be given for the inclusion of sports chiropractic in the management options of elite athletes".

This issue of The Chiropractic Report now reviews this important new trial and its significance in some detail. First however some background information on the hamstring muscles.

B. Hamstrings, Injury and Prevention

2. For much good information on the hamstring muscles, methods of injury, and injury prevention methods – many of which are popular with athletes, coaches and health professionals but all of which remain unproven – see the new Goldman and Jones Cochrane Review already mentioned. Summary comments drawn from this are:

a. Hamstrings are a group of muscles of the posterior thigh which cross both the hip and knee joints and are involved in thigh extension and knee flexion. The hamstring muscle group comprises three separate muscles: semitendinosus, semimembranosus and biceps femoria.

b. Hamstring injury is defined by the anatomical site within the muscle that is affected and injury must be present in one or more of the component muscles. Hamstring injuries are commonly classified as grades one, two and three where severity increases with the grade of injury.

c. Diagnosis is based on patient history, including the cause of injury and clinical findings of local pain and loss of function, demonstrated by palpation, range of motion and muscle testing.

*Study authors Henry Pollard (*left*) and Wayne Hoskins.*

Magnetic resonance imaging (MRI) can provide further information on the extent of injury.

d. Musculotendinous injuries usually occur as a result of either direct or indirect trauma. Direct trauma, such as from a blow, produce muscle bruising. Indirect trauma can occur as a result of alteration in the intensity or synergy of contraction, resulting in a single powerful muscle contraction. Hamstrings can produce large forces, of most benefit during periods of increased activity requiring bursts of speed or rapid acceleration and deceleration.

Recent evidence has suggested that the hamstring muscles are most vulnerable to injury during the rapid change from eccentric to concentric function, such as where the leg decelerates to strike the ground during running. (Concentric function is where a muscle actively shortens in order to produce movement. For example, concentric action of the quadriceps, the muscle at the front of the thigh, straightens the knee to produce a kicking action. Eccentric function is where a muscle generates active tension as it lengthens, braking a movement. For example, the hamstrings, situated at the back of the thigh, would function eccentrically to brake the kicking action).

Indirect trauma can also result from an overstretch of the musculotendinous unit leading to a strain, tear or avulsion. It is generally claimed that strain injuries most often occur near the musculotendinous junction.

e. The causes of hamstring injuries are complicated and multifactorial. A distinction in risk factors is often made between:

- Intrinsic (person-related) factors – e.g. hamstring muscle weakness, strength imbalances, fatigue, inadequate flexibility, body mechanics and disturbed posture, poor running technique and psychosocial factors.
- Extrinsic (environment-related) factors – e.g. unsatisfactory warm-up and training procedures, fatigue related to enforced excessive activity, poor playing surfaces and unsuitable training and sports specific activities.

Understanding the individual risk factors for injury is an important basis for developing preventive measures. Unfortunately the two most certain risk factors – age and prior injury – are not reversible.

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Changes of mailing instructions should be sent to The Chiropractic Report, 203–1246 Yonge Street, Toronto, Ontario, Canada M4T 1W5, telephone 416.484.9601, fax 416.484.9665. Printed by Harmony Printing Limited, 416.232.1472.

ISBN 0836-144

f. Many interventions are widely employed by athletes, trainers, coaches and therapists to prevent injuries. These include:

- Exercise therapy to strengthen and lengthen the hamstring muscles.
- Neuromuscular injury prevention strategies, including proprioceptive balance training.
- Chiropractic manipulative therapy and correction of lumbar-pelvic biomechanics.
- Muscle activation work to improve hip extension, motor patterns and running technique.
- Massage and mobilisation to increase flexibility and range of movement directed towards soft-tissue structures, articular structures and neural tissue.
- Education for awareness and avoidance of supposed risk – e.g. if an athlete has a running/training session and a weights session on the same day, do the

St. Kilda captain and superstar Nick Riewoldt leaves the field April 9 with a right hamstring injury sidelining him for 14 weeks.

running session first when less fatigued because that has greater risk of hamstring injury than weightlifting.

• Functional training and sport specific drills.

3. Orchard, already mentioned, is widely published in the international literature on hamstring injuries. In a practical article found under Research and Issues at

www.injuryupdate.com.au and titled *Preventing Hamstring Strains* he acknowledges that "for all our experience with hamstring injuries there is almost no proven method for preventing them". He then reviews various popular injury prevention theories and approaches including:

• **Strength training**. He describes how strength, usually measured by reduced hamstring to quadriceps H:Q ratio, is "the most controversial risk factor. Although many prospective studies have found a significant correlation between poor strength and risk of hamstring injury there are problems. First the confounder of past injury history has not been measured, second there are no controlled studies showing that attempting to reverse H:Q deficits can reduce the incidence of injuries. These things together with lack of acceptance by clinicians "make it very unlikely that the magic bullet for hamstring prevention is simply reversing strength deficits".

• **Stretching.** This is also "very unlikely to yield success". Almost all studies that correlate strength deficits with injury risk fail to find a correlation with flexibility. Athletes with greater speed show greater flexibility – but almost certainly have a higher injury risk.

Orchard's paper, written before publication of the new trial by Hoskins and Pollard, makes no mention of chiropractic or other manual treatments directed at structures non-local to the hamstring muscles themselves. We now look at the new evidence in that regard.

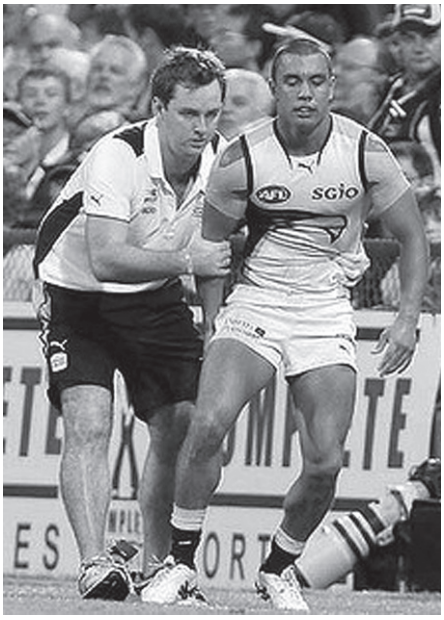
C. Hoskins and Pollard Trial

4. **Background and Goals.** Hoskins and Pollard are from the Macquarie Injury Management Group, Department of Chiropractic, Faculty of Science, Macquarie University, Sydney, Australia. Hoskins' postgraduate studies and research have focussed on the prevention and management of hamstring injuries. He had to temporarily relocate from Sydney to Melbourne for the trial, for which he was the treating clinician. Pollard, who is Director of Research at the Department of Chiropractic, Macquarie University, also serves as Chair of the Research Commission of the Fédération Internationale du Sport de Chiropratique (FICS – www.fics-sport.org) the international organization representing the specialty of sports chiropractic.

They were aware that hamstring injuries are a major problem for the AFL and its players, that there were very few well-designed studies on injury prevention, and that there were none on chiropractic preventive care. As a result they designed an RCT with the following objective:

"to investigate whether a sports chiropractic intervention consisting of pragmatically and individually determined high-velocity low-amplitude (HVLA) manipulation, mobilization and/or supporting soft-tissue therapies to the spine, pelvis and extremity could reduce local and non-local hamstring injury risk factors to prevent the occurrence of hamstring and other non-contact lower limb injuries in semi-elite Australian Rules footballers".

To set up the trial they applied to the AFL Research Board for funding. As a prerequisite they needed the support of one of the AFL's 16 clubs. Notwithstanding that no club employed a chiropractor on its medical staff, 5 clubs agreed to support the project. They would help with recruitment of players/subjects from their feeder clubs.



West Coast's Daniel Kerr goes down with a hamstring injury on April 16.

In fact no funding was given by the AFL Research Board. Four clubs with semi-elite players based in Melbourne in the Victorian Football League (VFL) agreed to participate, with consent from management, coaching and medical staff. This would have given the planned 120 players/subjects for the trial to have the desired numbers and statistical power. Because of changed medical staff 2 clubs pulled their support at a late stage. As a result the trial proceeded with 2 clubs and 60 subjects – 30 for each of the treatment and control groups.

5. **Inclusion/Exclusion Criteria.** Players were eligible for the trial if they were listed players in their club's VFL squad and did not have 'red flag' conditions (e.g. fractures or destructive spinal lesions) or 'yellow flags' (e.g. litigation, insurance claims) or "severe history of chronic hamstring problems".

6. **Intervention.** For the 2005 playing season a final number of 59 players were randomly assigned in equal numbers to either a :

a. **Control group.** They received what was considered current best medical and sports science management as directed by club medical staff including medication, manipulative physiotherapy, massage, strength and conditioning and rehabilitation exercises. There was no limitation in the number or type of treatments and no influence from the study authors. This was the usual care

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by many unqualified practitioners who perform spinal manipulative therapy and "chiropractic" as part of their practices. They arrived on the scene when alternative medicine practices and colleges flooded the country in the early 1990s.

"The medical doctors on the Ministry of Health's committee reviewing the proposed new law were not against us at any time in the process", says Dr. Kenin, "and restriction from primary contact with patients was not raised in any of the discussions".

This was a significant turnaround. At various times during the past 20 years the ICS was offered legislation on the basis that the ability to diagnose was not recognized and was not in the scope of practice. As elsewhere in the world this was always rejected by the profession – the wisdom of that can now be seen.

The ICS and its members also united behind and used the definition of chiropractic appearing in the WHO Guidelines on Basic Training and Safety in Chiropractic (2005) namely:

'A health care profession concerned with the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal system and the effects of these disorders on general health. There is an emphasis on manual techniques, including joint adjustment and/or manipulation, with a particular focus on subluxations'.

ACC Research Agenda Conference 2010

This year's Association of Chiropractic Colleges' Research Agenda Conference (ACC-RAC) at Caesar's Palace, Las Vegas held March 18-20 was attended by 450 delegates. It was bigger and better than ever.

ACC-RAC is the major annual academic and research meeting in North America, and attracts educators and researchers worldwide. In the opening session Drs. Scott Haldeman, Pierre Côté and Donald Murphy gave an overview of the current status of the cervical adjustment/stroke issue. Following publication of the Bone and Joint Decade Task Force Report in 2008 best evidence is that stroke is associated with rather than caused by chiropractic or medical treatment. Screening tests have no value. The focus should shift to diagnosis – recognizing sudden severe neck pain/headache like nothing the patient has experienced before, and other signs and predisposing factors that suggest a stroke in progress.

Dr. Deborah Kopansky-Giles of Toronto, won the prestigious NCMIC Jerome McAndrews Memorial Award for international contribution to and excellence in research. She is the Coordinator of Chiropractic Services at St. Michael's Hospital, a teaching hospital for the University of Toronto, Faculty of Medicine, where she serves on the Interprofessional Education (IPE) Advisory Committee. Dr. Kopansky-Giles' research and professional interests are in the fields of IPE and policy development for the integration of chiropractic and medical services.

There was much evidence of the increasing move to integrated spine care in the US. There have been many reports of the integration of chiropractic services within the US Federal Government's Veterans' Administration and Military Healthcare Systems. At ACC-RAC there were many doctors of chiropractic working within private hospital systems.

One, for example, is Dr. Ian Paskowski, Medical Director, Spine Care, Jordan Hospital System, Plymouth, Massachusetts. Dr. Paskowski (New York Chiropractic College 2002), who played professional hockey for the Washington Capitals in the 1990s, did a preceptorship with Dr. Bill Morgan at the Bethesda National Naval Medical Center during his last trimester at NYCC and found this "my most important influence in understanding how DCs can work within mainstream healthcare".

He subsequently established an interdisciplinary chiropractic/physiotherapy clinic in Plymouth and developed a triage process for spine care that was adopted by local physician groups.

The Jordan Hospital in Plymouth was developing 5 care pathways for prevalent conditions using primary care providers – spine care, breast care, wound care, cancer care and a sleep centre. Each was to have a medical director. In 2008 Dr. Paskowski was invited to be the Medical Director for spine care.

Today he and two chiropractic associates are the main triage doctors for spine care for the hospital. Jordan Hospital is a 160 bed community-based non-profit hospital in south east Massachusetts.

World Spine Care – Botswana

World Spine Care is a visionary new project led by Dr. Scott Haldeman which has the goal of helping people in underprivileged regions of the world who suffer from health problems related to the spine. WFC will recruit volunteer healthcare professionals including chiropractors, physicians and physical therapists to provide core spine care. Volunteer specialists will fly in to deal with patients referred with serious spinal pathology.

Incorporated as a US non-profit organization, WSC has multidisciplinary leadership, strong corporate support and is endorsed by the WHO through the Bone and Joint Decade. Collaborating centres include Palmer College and the Canadian Memorial Chiropractic College. For more details visit www.worldspinecare.com.

Botswana is a proposed first country for intervention and assistance. In February a delegation comprising Dr. Haldeman, Dr. Geoff Outerbridge (Canada), Dr. Reg Engelbrecht (South Africa) and Dr. Evalie Heath, one of Botswana's two resident chiropractors, visited government and healthcare leaders in Botswana to introduce them to World Spine Care.

The delegation reports that it was welcomed, taken to various villages and other locations that might be a focus for the project and that plans for instituting WSC in Botswana are now progressing strongly.

WFC Eastern Mediterranean Seminar 2010

The World Federation of Chiropractic's 5th Annual Eastern Mediterranean Region Seminar, held April 24-25, at the Jordan University of Science and Technology (JUST) in Irbid, Jordan was attended by chiropractors from 10 countries in the region – Cyprus, Egypt, Iran, Jordan, Lebanon, Palestine, Saudi Arabia, Syria, Turkey and the United Arab Emirates. It featured:

• On April 24, an interdisciplinary spine care conference as part of an ongoing project to commence a first chiropractic school in and for the Middle East at JUST.

• On April 25 a formation of the Eastern Mediterranean and Middle Eastern Chiropractic Federation (EMMECF), a new regional association. Elected officers are Dr. Stathis Papadopoulos (Cyprus), President, Dr. Mustafa Agaoglu (Turkey), Vice-President, Dr. Samer Shebib (Syria), Vice-President, Dr. Abdullah Al-Harbi (Saudi Arabia), Treasurer and Dr. Reza Jafari (Iran), Secretary.

Keynote chiropractic speakers at the seminar included Dr. Jean Moss, President, Canadian Memorial Chiropractic College (on chiropractic education), Dr. Scott Haldeman (on the BJD Neck Pain Task Force and its new model of neck pain and its management) and Dr. John Triano (on management of back pain and the biomechanical effects of spinal manipulation). Keynote speakers from the JUST School of Medicine included surgeons Dr. Mohammad Barbarawi (cervical spine) and Drs. Ziad Odat (lumbar spine) and Khalid El-Salem, Associated Professor of Neurology.

JUST is the second largest public university in Jordan. It focuses entirely on health and sciences and has over 20,000 students. Programs include medicine, dentistry, pharmacy, nursing, veterinary medicine, allied health sciences including PT, OT, optometry, speech pathology. Its impressive campus is spread over 3,000 acres.

(From left) *Dr. Scott Haldeman, Dr. Khalid El-Salem, Dr. John Triano*

European Chiropractors' Union

There has just been mention of the newly formed Eastern Mediterranean and Middle Eastern Chiropractic Federation. Other relatively new regional federations in the profession are the Asia Pacific Chiropractic Doctors' Federation (APCDF) and the Federacion Latino Americana de Quiropractica (FLAQ – www.flaq.org).

However it is the European Chiropractors' Union founded in 1932, that is the strongest regional organization in the chiropractic profession. Following the recent entry into membership of Hungary it represents 20 national associations. Its website is www.ecunion.eu.

The ECU has helped to establish legislation in its member countries – the first chiropractic legislation in Europe being in Switzerland in 1939 – and also to establish schools of chiropractic, the European Council on Chiropractic Education (ECCE) and more recently the European Academy of Chiropractic (EAC).

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they would have been receiving if there had been no research project. Or an:

b. **Intervention group**. They received the same best management as the control group, but in addition pragmatic chiropractic treatment from a single experienced clinician. Features of the chiropractic management included:

- Treatment as determined appropriate on an individual patient/subject basis.
- One or more of joint manipulation (HVLA – high-velocity low-amplitude), joint mobilization (passive movement without thrust and within normal range of motion) and soft-tissue therapies.
- Directed to the spine, pelvis and extremity.
- Minimum duration and frequency of treatment of 1 treatment per week for 6 weeks (Phase 1 – the late pre-season period where pre-season matches were played) followed by 1 treatment per fortnight for 3 months then 1 treatment per month for 3 months - the remainder of the season (Phase 2).

Table 1 describes the treatment given to the intervention group throughout the study. The average number of treatment visits was 17 per player. All players received manipulation and/or mobilization – 92% received manipulation.

On the average treatment visit manipulation and/or mobilization was directed at 4 of the 5 treatment areas – thoracic spine, knee, hip, lumbar spine and sacroiliac joint. However overall the slight majority of treatments (53%) was soft-tissue techniques – principally to the gluteal region and lumbar spine, but also to the hip flexors, knee and posterior thigh.

Overall treatment was predominately directed at areas non-local to the hamstrings.

7. **Outcome Measures.** The primary outcome measure adopted was the one used in the AFL Injury Surveillance System, "currently considered the most reliable . . . method in team sports". That is the number of games missed due to injury. The injuries monitored in this study were hamstring, other lower limb muscle and non-contact knee injuries. The definition of injury, again using the AFL method, was "any physical or medical condition that prevents a player from participating in a regular season (home and away) or finals match".

Injury diagnoses were determined by club medical staff who were blinded to group allocation and therefore treatment being given. Staff used either clinical features of injury, advanced imaging or both at their discretion. The club medical and coaching staff independently determined this – there was no interference from the study authors.

Secondary outcome measures were the short form McGill Pain Questionnaire (MPQ-SF) for low-back pain and the 39 item Health Status Questionnaire (SF-39). Players completed these prior to randomization into the trial and at the midpoint of the season – after 18 weeks of intervention and 12 home and away season matches.

Finally there was surveillance for adverse outcomes from the treatment being studied, mainly injury defined as "any undue pain, discomfort or disability arising during, immediately after or subsequent to chiropractic therapy that resulted in missed participation in a match or training session" or required additional medical care.

8. **Results.** There were no baseline or starting differences between players in the intervention and control groups for age and hamstring and knee injury history – important because these are the main risk factors for new injury. Results were:

a. **Lower Limb Muscle Strain.** Those in the intervention group and receiving chiropractic care had a statistically significant reduced risk of injury – injury rates were 3.6% in the intervention group and 27.6% in the control group. This had a large impact on missed matches. There were only 4 missed matches for lower limb muscle strain for the 28 players in the intervention group who completed the trial, 21 missed matches for the 29 in the control group.

b. **Hamstring Injuries.** There was a similar trend, but this did not reach the level of statistical significance. The incidence of injury in the intervention group was again 3.6% with 4 matches missed. This compared with 17.2% in the control group with 14 matches missed.

c. **Non-Contact Knee Injury.** Incidence of injury in the intervention group was 3.6%, in the control group 24.1%. There was a statistically significant difference in the number of matches missed – 1 in the intervention group, 24 in the control group.

d. **Adverse Reactions.** No player reported an adverse reaction to the intervention/chiropractic care.

e. **Low-Back Pain.** On the McGill Pain Questionnaire at baseline and at midpoint of the season there was a statistically

Table 1. Description of the treatment rendered to the intervention group

	Intervention group (n=29)
Number of treatments	487 (mean per player 17)
Amount of manipulation and/or mobilization to joint regions	2000 (47% total treatment, mean 4 per treatment)
Location of manipulation and/or mobilization	Thoracic spine 21%, knee 18%, hip 18%, lumbar spine 15%, sacroiliac joint 12%
Manipulation and mobilization breakdown	HVLA manipulation only 56%, HVLA manipulation and mobilization 36%, mobilization only 8%
Amount of soft tissue techniques to soft tissue regions	2258 (53% total treatment, mean 4 per treatment)
Location of soft tissue techniques	Gluteal region 22%, lumbar spine 12%, hip flexors 10%, knee 9%, posterior thigh 6%

* Soft tissue structures are defined as surrounding the involved joint (muscle, tendon, ligament, fascia, etc.)

From Hoskins and Pollard, BMC Musculoskeletal Disorders, 2010

significant reduction in overall and current back pain in the intervention group but not the control group.

f. **Health Status.** At mid season on the SF-39 health status questionnaire there was statistically significant improvement on various measures only for those in the intervention group – on the measures of bodily pain, role imitations due to physical health, general health and physical summary score.

Hoskins and Pollard emphasize that most of the chiropractic treatment was not directed to the hamstring areas, and that the results suggest that a variety of non-local factors amenable to multidisciplinary management appear to contribute to hamstring and other lower limb injuries. Their findings, they conclude "are important due to their potential for injury reduction, performance benefit and cost-saving practices for a relatively low-cost intervention".

9. The authors discuss any potential bias or limitations in their study. The main concern is the smaller number of subject players than was originally planned and was desirable. On one hand this means some of the positive trends seen did not reach statistical significance, cannot be properly assessed for clinical significance, and that these results need to be confirmed in a larger study before definitive claims of benefit can be made. On the other hand, as they note, there is "a strong likelihood of a Type 2 error" – a finding of no statistically significant benefit of prevention of hamstring and non-contact knee injuries when there was in fact such benefit, not seen because the size of the study gave it inadequate statistical power to show benefit.

Because this was a pragmatic study, with the chiropractic management comprising various treatments, and treatments tailored to the needs of individual players as assessed by the clinician, players in the intervention group were not blind to the fact they were receiving chiropractic care. This means that the trial was single-blinded (the medical staff assessing results were blinded as to which group a player was in) rather than double-blinded, and that it cannot be ruled out that intervention effects were all or part placebo effects. Further if benefit was the result of chiropractic treatment the specific aspect of treatment that was beneficial cannot be identified.

However these are simply the inevitable limitations of this pragmatic trial design – one that is increasingly common and has many advantages. First it allows research with elite sports teams, second each of specific and non-specific/placebo effects are legitimate and important in healthcare, and third this design compares management protocols as they actually exist in the community. It tests real life *effectiveness* as opposed to optimum trial condition *efficacy*, giving the research strong external validity.

10. Go to the paper for a detailed review of likely mechanisms of action/reasons why the intervention treatment would be successful. It is available online at www.biomedcentral.com/1471-2474/11/64 . Summary comments are:

- The authors suggest that the most significant difference between treatment offered to the intervention and control groups was the quantity and range of HVLA manipulation. The physiotherapy manual therapy included in best medical care given to both groups was not recorded but, based on observation, experience and published research, will have principally been joint mobilization and soft-tissue therapy.
- A major impact of the HVLA manipulation is likely improved neuromuscular control of the lumbopelvic region, creating improved function of the hamstrings – changes to existing length-tension and force-velocity relationships of the hamstrings that provide risk of injury.
- There was a high prevalence of back pain in the players recruited for this study. A number of authors, including Hoskins and Pollard in earlier work, have noted the now large body of research demonstrating that dysfunction in the low back "is associated with changes in lumbopelvic muscle activation and recruitment, including activation of biceps femoris and alteration in neuromuscular control strategies, all of which could contribute to injury".

D. Conclusion

11. Accordingly, here is an important new trial. Consider the potential benefits to soccer clubs such Real Madrid, AC Milan and Manchester United which pay huge amounts for star players and are devastated by lower limb injuries that cause these stars to lose playing time. This trial was performed in 2005, won a major clinical research prize at the World Federation of Chiropractic's Congress in May 2007 and was ready for publication at that time.

Why did it take 3 years to publish? As the new Cochrane review acknowledges it is valuable new work in an important field where there is a dearth of evidence. Interestingly the paper was submitted to and refused by three prominent sports medicine journals – Medicine and Science in Sports and Exercise, the British Journal of Sports Medicine, and the Clinical Journal of Sports Medicine. Only then was it submitted to and published by BMC Musculoskeletal Disorders.

Hoskins and Pollard have presented the results at a number of meetings, including the 2008 Football Australasia Conference, conferences run by individual AFL clubs and a 2009 tutorial for physicians provided by the Australasian College of Sports Physicians.

There will be much wider promotion now that there has been publication and the full results and methodology are available for review. The authors' hopes are that this will produce funds for a second larger trial and lead to greater integration of sports chiropractic services into the sports medicine care for AFL teams and other elite athletes in Australia.

There is much greater use of chiropractic services in professional football in the US. Currently all 32 teams in the National Football League (NFL) have team chiropractors who belong to a Professional Football Chiropractic Society (www.profootballchiros.com). Hall of Famer Jerry Rice is a national spokesperson for the profession. Internationally many elite football clubs, such as Chelsea in the UK and AC Milan in Italy, now have team chiropractors. Skiers and skaters at the Winter Olympics, and sprinters and gymnasts at the Summer Olympics are attended by chiropractors. When Canadian sprinter Donovan Bailey won the 100m in world record time at the Atlanta Olympic Games his first comment in the post race television interview was one of thanks to his chiropractor for keeping him injury free. However the road to even greater awareness and acceptance of the contributions chiropractic care can make must be paved with good quality research – congratulations to Hoskins and Pollard for their fine and continuing contribution. TCR

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As the academic arm of the ECU the EAC is responsible for the academic development of chiropractic in Europe including support for institutions, promotion of research, provision of postgraduate education and development of specialty organizations.

European countries belong to the European Union governed by a European Parliament – this is why it is so important that the ECU exists as a regional organization promoting the uniform development of chiropractic throughout Europe. It has been ECU political representation that has provided the basis for legislation to recognize the chiropractic profession in recent years in countries such as Belgium, France, Italy and Portugal. These advances followed the 1997 adoption by the European Parliament of the Lannoye Report, a report on complementary medicine prepared followed intense lobbying by the ECU.

A further important ECU initiative for the standardization of chiropractic in Europe, commenced in 2008, and with a goal of facilitating legal recognition and regulation in all countries, is working with the European Committee for Standardization (CEN) to draw up voluntary technical specifications for education and practice for chiropractors throughout Europe. CEN standards are recognized by all European countries. A final meeting is schedule for Copenhagen in early June and these standards – which will be of interest throughout the world – are expected to be formalized and available before the end of the year.