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The Relationship between Spinal Dysfunction and Reaction Time Measures.

The objective of this study, by researchers from New Zealand College of Chiropractic (NZCC), Auckland, New Zealand, was to investigate the relationship between the number of sites of spinal dysfunction and a range of measures of cognitive processing.

The study design was a double-blind, randomised; observational pilot study was performed at the NZCC clinical training facility. Thirty volunteers with clinical evidence of cervical spinal joint dysfunction participated. Subjects were classified into 2 groups depending on whether they exhibited signs of cervical spinal joint dysfunction at one or more sites. A range of computer-based tasks were used to determine simple reaction time (RT), choice RT, probe RT, and inhibition of a preplanned response.

The authors report that multiple sites of cervical spinal joint dysfunction were related to impaired cortical processing as revealed by significantly higher loads on central capacity, significantly less accurate response selection, and a trend toward more variable performance of an anticipated response. Multiple sites of cervical spinal joint dysfunction do not appear to be related to the speed of response selection or the ability to inhibit a preplanned response.

The authors conclude,

“This pilot study provides a context for the improvements in cortical processing observed after cervical spine adjustment. It shows that probe RT may be a useful tool in further studies examining the effects of cervical spine manipulation of joint dysfunction and the associated effect on cognitive function.”

Reference: Lersa LB, Steiner CM, Lersa RA. *The relationship between spinal dysfunction and reaction time measures.* J Manipulative Physiol Ther 2005;28:502-7.

Evaluation of Healing by Gentle Touch

The stated objectives of this pre- post-treatment study were to evaluate the effectiveness and safety of healing by gentle touch in clients attending The Centre for Complementary Care (CCC) in Eskdale, Cumbria.

The study design involved the evaluation of data collected by questionnaire over 6 years.

All clients attending the CCC between 1995 and 2001 were invited to participate in this study, and data were collected from 300 subjects with a wide range of ailments who received four treatment

sessions within 6 weeks. Exclusion criteria were: recent treatment at the CCC; failure to complete four treatment sessions; and age under 16 years. Outcome measures included comparison of pre- and post-treatment levels of physical (pain, disability, immobility, sleep disturbances, reliance upon medication, daily activities) and psychological (stress, panic, fear, anger, relaxation, coping, depression/anxiety) functioning; these were assessed using a questionnaire with visual analogue scales for subjective rating of symptoms and the EuroQoL (EQ-5D), a generic state-of-health measure.

The authors report that Wilcoxon signed ranks tests showed statistically significant improvements in both psychological and physical functioning, particularly in stress reduction (median stress levels fell by four points), pain relief (median pain ratings fell by two points), increased ability to cope (median improvement of three points) and increased general health ratings (median improvement of 20 points) between study entry and end of treatment ($P < 0.0004$ for all these symptoms). The most substantial improvements were seen in those with the most severe symptoms at study entry. No adverse effects of treatment were documented.

The authors conclude,

“This audit of treatment outcomes provides evidence consistent with the hypothesis that healing, as provided at the CCC, was associated with improved psychological and physical functioning in the majority of subjects, and is worthy of further evaluation.”

ASRF Chiropractic Update Editor’s comment - The extent to which the authors of the above study were able to achieve the study’s stated objectives (To evaluate the effectiveness and safety of healing by gentle touch) are severely constrained by limitations inherent in studies of this nature.

Reference: Weze C, Leathard HL, Grange J, Tiplady P, Stevens G. *Evaluation of healing by gentle touch*. Public Health 2005; 119:3-10.

The use of Chiropractic amongst Young Australians¹ and Elderly Americans² - Results from Two Recent Surveys.

The authors of the first of these surveys¹, from the Department of General Medicine, University of Melbourne, and Murdoch Children’s Research Institute, Royal Children’s Hospital, Melbourne, Victoria, Australia, began with the observation that,

"The use of complementary and alternative medicine (CAM) within the Australian community is common".

The stated objective of the study was to determine the prevalence and pattern of CAM usage in children attending a tertiary children’s hospital.

The authors conducted a cross-sectional survey of children attending the Royal Children's Hospital, Melbourne. Children were identified by consecutive acute admissions and attendance at outpatient clinics. A structured questionnaire with items about the use of CAM in the preceding year was administered by means of a face-to-face interview.

Based on the 503 children surveyed, **51% reported CAM use in the preceding year.**

Forty-three percent (43%) had used at least one CAM medication. The most common medicinal CAM's used were multivitamins, vitamin C, herbal remedies and homeopathic treatments.

Non-medicinal CAM was used by 23% of the participants. The **most commonly** used therapies were **chiropractic**, naturopathy, aromatherapy, therapeutic massage and dietary restriction.

The main reasons stated for CAM usage included promotion of general health and treatment of colds. Sixty-three percent of those reporting CAM use had not discussed this with their treating doctor.

It was concluded,

“The use of CAM by children is common. CAM is particularly used for the treatment of common illnesses and conditions of childhood. Importantly, use is not always conveyed to treating physicians. Given the potential risk of adverse events associated with the use of CAM or interactions with conventional management, doctors should ask about their use as a part of routine history taking.

The authors of the second of the two surveys² begin their paper by observing that the correlates of CAM utilization among older Americans have not been fully investigated.

Their study was designed to identify such correlates in a large sample of older American adults, and thereby generate new data relevant to consumer education, medical training, and health practice and policy.

A sub-sample from the 2000 Wave of the Health and Retirement Study (n = 1,099) aged 52 or older were surveyed regarding their use of CAM (**chiropractic**, alternative practitioners, dietary and herbal supplements, and personal practices).

The authors report that of respondents over 65 years of age, **88%** used CAM, with dietary supplements (65%) and **chiropractic (46%)** most commonly reported.

Users of alternate practitioners and dietary supplements reported having more out-of-pocket expenses on health than nonusers of these modalities. Age correlated positively with use of dietary supplements and personal practices and inversely with alternative practitioner use.

Men reported less CAM use than women, **except for chiropractic** and personal practices. Blacks and Hispanics used fewer dietary supplements and **less chiropractic**, but they reported more personal practices than Whites.

Advanced education correlated with **fewer chiropractic visits** and more dietary/herbal supplement and personal practices use. Higher income, functional impairment, alcohol use, and frequent physician visits correlated with more alternative practitioner use. There was no association between CAM and number of chronic diseases.

The authors conclude by suggesting that the implications of their findings are that,

“The magnitude and patterns of CAM use among elders lend considerable importance to this field in public health policy making and suggest a need for further epidemiological research and ongoing awareness efforts for both patients and providers”.

References:

- 1.) Lim A, Cranswick N, Skull S, South M. *Survey of complementary and alternative medicine use at a tertiary children's hospital*. J Paediatr Child Health 2005; 41:424-7.
- 2.) Ness J, Cirillo DJ, Weir DR, Nisly NL, Wallace RB. *Use of complementary medicine in older Americans: results from the health and retirement study*. Gerontologist 2005; 45:516-24.

Fostering Critical Thinking Skills: A Strategy for Enhancing Evidence Based Wellness Care

In addition to chiropractic functioning at the community-health care system interface, the chiropractic profession considers itself a provider of wellness care and this is subsumed under the mantle of maintenance care. "Maintenance" or "wellness" care involves regular, ongoing visits that are not correlated directly to symptomatology. However George B. McClelland, DC, Chairman ACA Board of Governors has stated "Philosophically the idea of regular spinal manipulative therapy opposes the concept of wellness". Furthermore it has been suggested that: "...the proposition of chiropractic as a "wellness profession" is not defensible." Conventional health care would concur given that there are those in the chiropractic profession whose practice of wellness care is limited to correcting subluxations. While the notion that mechanical and functional disorders of the spine, expressed as subluxations, can degrade health and correction of spinal disorders by adjustments may restore health is fundamental to chiropractic thinking, there is no scientifically acceptable data to support this belief. Furthermore, wellness care calls for a holistic approach and the desirability for the

chiropractic profession to explore a more comprehensive approach to wellness care is apparent given the Institute of Alternative Futures report *Future of Chiropractic Revisited: 2005 to 2010*, which suggested possible growth scenarios for chiropractic were as "wellness coaches" or as "healthy life doctors" with a wellness mindset.

If chiropractic is to evolve as a wellness profession in an increasingly evidence based health care system, it would seem necessary that it critically appraise its current wellness practices and adopt a schema in which its practitioners serve as motivators and educators. One initiative which may contribute to this end is to include in undergraduate education units which encourage critical thinking in the context of health promotion and disease prevention. Murdoch university provides their third year chiropractic students with just such a learning opportunity.

This paper, a case study, describes a unit which prepares chiropractic students for the role of "wellness coaches". Emphasis is placed on providing students with exercises in critical thinking in an effort to prepare them for the challenge of interfacing with an increasingly evidence based health care system.

This case study describes how health may be promoted and disease prevented through development of personalized wellness programs. As critical thinking is essential to the provision of evidence based wellness care, diverse learning opportunities for developing and refining critical thinking skills have been created.

Three of the learning opportunities are an intrinsic component of the subject and, taken together, contributed over 50% of the final grade of the unit. They include -

- A literature review,
- Developing a client wellness contract, and
- Peer evaluation.

In addition to these 3 compulsory exercises, students were also given an opportunity to develop their critical appraisal skills by undertaking voluntary self- and unit evaluation. Several opportunities for informal self- appraisal were offered in a structured self-study guide, while unit appraisal was undertaken by means of a questionnaire and group discussion at which the Head of School was present.

Formal assessment showed all students capable of preparing a wellness program consistent with current thinking in contemporary health care. The small group of students who appraised the unit seemed to value the diversity of learning experiences provided. Opportunities for voluntary unit and self-appraisal were used to varying degrees. Unit evaluation provided useful feedback that led to substantial changes in unit structure.

The author concludes,

“Students have demonstrated themselves capable of applying critical thinking in construction of evidence based wellness programs. With respect to unit design, selective use of learning opportunities highlighted the desirability of using obligatory learning opportunities to ensure exposure to core constructs while student feedback was found to provide useful information for enriching unit review. It is hoped inclusion of critical thinking learning opportunities in the undergraduate chiropractic curriculum will contribute to the development of an evidence based ethos in chiropractic care.”

Reference: Jamison JR. *Fostering critical thinking skills: a strategy for enhancing evidence based wellness care*. Chiropractic & Osteopathy 2005;13:19.

Physical Activity for Primary Prevention of Disease. Systematic Reviews of Randomised Clinical Trials.

Drugs are heavily promoted for primary prevention of disease whereas possible benefits of physical activity have received less attention. We have studied whether there is reliable evidence that exercise is effective.

The study's authors searched MEDLINE and The Cochrane Library for systematic reviews of randomised clinical trials published 1998-2004.

The authors report having identified 31 eligible reviews and excluded 20 that contained trials covered in larger reviews or were older than other reviews on the same subject. The 11 included reviews comprised altogether 252 trials and 16,179 participants. Generally, the included trials were of poor quality. **The most reliable result was that exercise in the elderly can reduce falls resulting in injury**, relative risk 0.7, although this effect could be due to modification of risk factors. Other results were a reduction in systolic blood pressure by 3.8 mmHg and diastolic blood pressure by 2.6 mmHg, beneficial changes in blood lipids, a positive effect on bone mineral density in the spine of 1.8%, and a lack of effect on smoking cessation.

The reporting of harms of exercise was virtually non-existent.

It is concluded that exercise can have important benefits. There is a need for large trials that live up to accepted standards and include measurement of harms, in particular for trials that compare exercise with drugs.

References: Karmisholt K, Gyntelberg F, Gotzsche PC. *Physical activity for primary prevention of disease. Systematic reviews of randomised clinical trials*. Dan Med Bull 2005;52:86-9.

**Physical Activity for Secondary Prevention of Disease.
Systematic Reviews of Randomised Clinical Trials.**

Physical activity is recommended for secondary prevention of several diseases but it is not always clear how reliable the evidence is.

The authors searched MEDLINE and The Cochrane Library for systematic reviews of randomised clinical trials published 1998-2004.

They report having identified 30 eligible systematic reviews and excluded 13 that contained trials covered in larger reviews or were older than other reviews on the same subject. **Physical activity decreased all-cause mortality in patients with coronary heart disease, odds ratio 0.73, increased maximum walking time in patients with intermittent claudication by 6.5 min, and decreased pain in patients with osteoarthritis of the knee, standardised mean difference 0.34.**

There were positive effects also in heart failure, chronic obstructive lung disease, type 2 diabetes and fibromyalgia, but they need confirmation in high-quality trials. Exercise improved quality of life in several conditions and generally led to improved physical performance.

An effect was not shown in stroke, asthma, rheumatoid arthritis, acute or chronic low back pain, chronic fatigue syndrome, depression, cystic fibrosis or HIV/AIDS.

The occurrence of harm was generally not reported.

In conclusion, physical activity can have important, and even life-saving, effects as secondary prevention of disease, but more and better trials are needed to fully assess its benefits and harms, in particular trials that compare exercise with drugs.

Reference: Karmisholt K, Gotzsche PC. *Physical activity for secondary prevention of disease. Systematic reviews of randomised clinical trials.* Dan Med Bull 2005;52:90-4.

Reflections on the “Type O” Disorder

In 1979, the Royal Commission into Chiropractic in New Zealand popularized a description of musculoskeletal and nonmusculoskeletal injuries presenting to chiropractors. The terms referred to the treatment of “type M” (musculoskeletal) conditions and visceral “type O” (organic) conditions. Although chiropractors are considered to appropriately treat the type M condition, treatment of the type O condition is not considered as appropriate by many inside and outside the profession. Chiropractors usually cite research into the somatovisceral reflex as a mechanism to support their position. Although this research is of high quality, it is lacking in its direct application to chiropractic management strategies.

Chiropractors have been treating visceral conditions since the inception of their profession. This treatment has been diverse in nature, and some have claimed to be treating all manner of visceral dysfunction and disease. Despite the chiropractic profession being approximately 110 years old, very little research into the effect of chiropractic manual therapy has been conducted in this subgroup of the population of patients who the chiropractor treats. In addition, psychosocial issues have been recognized as important to the work of chiropractors for some time; however, their potential role in the generation of type O disorders has not been so recognized. Although there have been a few attempts at investigating treatment of visceral conditions, much of the data are flawed by limited or poor methodology, and many of the conclusions are weak, irrelevant, or negative in nature. Despite this, some small-power studies have shown positive outcomes for such management. Many of the claims cite a mechanism that involves the somatovisceral reflex. This article discusses the relevance of the somatovisceral reflex as the main mechanism in the proposed effect by manual therapy on the type O condition and its relevance to potential management and research.

The author concludes with his answer to the question, “Where to from here?”

He states,

“Chiropractors should embrace evidence-based research into the type O condition or face becoming increasingly marginalized by those inside and outside our profession. Much work has already begun into the somatovisceral reflex. Work by Sato, Budgell, and Bolton is being followed by other research groups, including groups from Japan and Australia. However, much of this research appears to focus on the spinal aspects of the somatovisceral reflex with the supraspinal aspects largely ignored.

It is timely for chiropractors to embrace the research on the supraspinal influences in the type O condition, both within the laboratory (animal based) and in the clinic (human clinical trials).

Chiropractic is at a crossroad in its development in many ways. With regard to the type O disorder rather than the profession developing an almost dualistic support for the type O/type M vitalistic/mechanistic approaches to management, there exists an acceptable model to act as a bridge between the collective treatment impasse. The embrace of the supraspinal influences inherent in the biopsychosocial model may serve us well when investigating the enigma that is evidence-based practice.”

Reference: Pollard H. *Reflections on the “type O” disorder*. J Manipulative Physiol Ther 2005;28:547.

A Critical Appraisal and Defense of the Oxfordshire Low Back Pain Trial - A Discussion

(The following discussion piece was published, in the peer reviewed journal *Physiotherapy*, by the authors of an RCT in response to criticism they received in relation to their study (results published in

BMJ [2] which found no significant short-term or lasting effect of physiotherapy treatments amongst sub-acute and chronic low back pain patients <http://www.sciencedirect.com>.

The costs of National Health Service (NHS) physiotherapy for low back pain were estimated to be £251 million in 1998 [1]. Physiotherapy resources are overstretched and it is essential to make the best use of services available. The frustration and lack of a real cure for low back pain has led to a number of different interventions evolving without recourse to clinical trials. In 1995, managers of the Oxfordshire physiotherapy services were challenged in the Health Authorities Priorities Forum to provide evidence that the service they offered people with back pain was effective. A trial was designed following lengthy discussion with clinicians and researchers to assess the effect of commonly delivered physiotherapy treatment for patients with sub-acute and chronic low back pain [2].

Two hundred and eighty-six patients were randomised to receive either: a course of physiotherapy treatment based on widely practiced clinical reasoning skills and models of provision (therapy group) or advice to remain active (advice group). In addition, both groups were given 'The Back Book'—a booklet compiled by experts containing advice on how to manage back pain, stay active and avoid disability. Patients were treated in seven NHS primary health care and hospital settings, and were recruited from routine referrals. Inclusion criteria were broad to ensure representation of the range of patients who consult NHS outpatient low back pain services. Outcomes were measured over a 12-month period, and included back-pain-specific and health-related quality-of-life measures and a measure of patient-perceived benefit. The analysis was carried out on the 'intention to treat' principle, i.e., patients were analysed in the groups in which they were randomised regardless of treatment received, and the analysis incorporated a robust method of dealing with missing data. These principles are essential to minimising bias.

There was no evidence of a significant short-term or lasting effect of additional physiotherapy treatments in back pain or health-related quality-of-life measures. Not unsurprisingly, patient's self-rated response to treatment was somewhat higher in the therapy group—the most likely explanation is the greater amount of attention provided.

The most novel aspect of the trial was the introduction of a single session of assessment and advice given by a physiotherapist as the 'control' treatment. The evidence collected in the trial suggests that this model of treatment was, in general, well received.

In the therapy group, the most common treatments provided were spinal joint mobilisation techniques and lumbar spine mobility and abdominal strengthening exercises. There were few constraints on what therapists could do, or on the models of clinical reasoning that could be used.

As is common in medical journals, we have already discussed in detail the potential shortcomings and biases within our study [2]. These include selective uptake into the trial, but this was no worse than many other trials. Loss to follow up was 30% at 12 months but thorough analysis and imputation of

missing data provide reassurance that threats to the internal validity of the trial are small. It is important not to lose sight of the strengths of the study. It was randomised and based on an a priori sample size estimate, essential to minimising the risk of a false-negative (or false-positive) result. Allocation to treatment was concealed from individuals who could potentially manipulate results, and loss to follow up at the earlier time points of assessment was well within bounds of acceptability.

Our trial has been criticised for not analysing sub-groups of patients with differing patterns of presentation, or, looked at from a different viewpoint, that we incorporated too broad a group of patients. Such arguments depend on an unproven and highly contentious paradigm that it is possible to classify sub-populations of back pain patients and to deliver defined and effective interventions within these paradigms. Sub-group analysis was not pre-specified, and was correctly avoided in analysing and reporting the results [3]. The trial has also been criticised for providing too many different types of treatment by varying grades of staff. It is important to remember that the trial was designed and did reflect the everyday lottery of physiotherapy provision in the NHS. If most therapists take a step back, they will recognise the methods of provision as being common in many departments. The trial cannot tell us which treatments work best for low back pain, but what they do indicate is that widely practised models of physiotherapy provision are overall no better than a simple intervention of assessment and advice.

Although the results might be disappointing, this is a high-quality trial that reflects treatment available in the NHS [4]. For patients with similar symptom profiles, physiotherapists should consider one session of assessment and advice rather than prolonged treatment. The trial results have been considered in the context of the wider research literature in the recently published European guidelines for the management of low back pain, commissioned by the European Co-operation in the field of Scientific and Technical Research (C.O.S.T., www.backpaineurope.org). Physiotherapists should continue to engage in the very important process of generating high-quality research evidence for emerging models of care. Research should be viewed as a strength and not a weakness of a profession if the needs of the patients and populations we serve are to be met.

References

- [1] N. Maniadakis and A. Gray, The economic burden of back pain in the UK, *Pain* 2000;84: 95-103.
- [2] H. Frost, S.E. Lamb, H. Doll, P. Taffe Carver and S. Stewart-Brown, Randomised controlled trial of physiotherapy compared with advice for low back pain, *BMJ* 2004;329:708-11.
- [3] R. Collins, R. Gray, J. Godwin and R. Peto, Avoidance of large biases and large random errors in the assessment of moderate treatment effects: the need for systematic overview, *Stat Med* 1987;6:245-50.
- [4] N. Foster, K. Thompson, G. Baxter and J.M. Allen, Management of non-specific low back pain by therapist in Britain and Ireland. *Spine* 1999;24:1332-42.

Grommets for Hearing Loss Associated with Otitis Media with Effusion in Children.

Otitis media with effusion (OME), or 'glue ear', is very common in children, especially between the ages of one and three years with a prevalence of 10% to 30% and a cumulative incidence of 80% at the age of four years. OME is defined as middle ear effusion without signs or symptoms of an acute infection. OME may occur as a primary disorder or as a sequel to acute otitis media. The functional effect of OME is a conductive hearing level of about 25 to 30 dB associated with fluid in the middle ear. Both the high incidence and the high rate of spontaneous resolution suggest that the presence of OME is a natural phenomenon, its presence at some stage in childhood being a normal finding. Notwithstanding this, some children with OME may go on to develop chronic otitis media with structural changes (tympanic membrane retraction pockets, erosion of portions of the ossicular chain and cholesteatoma), language delays and behavioral problems. It remains uncertain whether or not any of these findings are direct consequences of OME. The most common medical treatment options include the use of decongestants, mucolytics, steroids, antihistamines and antibiotics. The effectiveness of these therapies has not been established. Surgical treatment options include grommet (ventilation or tympanostomy tube) insertion, adenoidectomy or both. Opinions regarding the risks and benefits of grommet insertion vary greatly. The management of OME therefore remains controversial.

OBJECTIVES: To assess the effectiveness of grommet insertion compared with myringotomy or non-surgical treatment in children with OME. The outcomes studied were (i) hearing level, (ii) duration of middle ear effusion, (iii) well-being (quality of life) and (iv) prevention of developmental sequelae possibly attributable to the hearing loss (for example, impairment in impressive and expressive language development (measured using standardised tests), verbal intelligence, and behaviour).

SEARCH STRATEGY: We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library Issue 1, 2003), MEDLINE (1966 to 2003), EMBASE (1973 to 2003) and reference lists of all identified studies.

SELECTION CRITERIA: Randomised controlled trials (RCTs) evaluating the effect of grommets on hearing, duration of effusion, development of language, cognition, behaviour or quality of life. Only studies using common types of grommets (mean function time of 6 to 12 months) were included.

DATA COLLECTION AND ANALYSIS: Data from studies were extracted by two reviewers and checked by the other reviewers.

MAIN RESULTS: Children treated with grommets spent 32% less time with effusion during the first year of follow-up. Treatment with grommets improved hearing levels, especially during the first six months. In the randomised controlled trials that studied the effect of grommet insertion alone,

the mean hearing levels improved by around 9 dB after the first six months, and 6 dB after 12 months.

Ears treated with grommets had an additional risk for tympanosclerosis of 0.33 one to five years later. In otherwise healthy children with long-standing OME and hearing loss, early insertion of grommets had no effect on language development or cognition. One randomised controlled trial in children with OME more than nine months, hearing loss and disruptions to speech, language, learning or behaviour showed a very marginal effect of grommets on comprehensive language.

AUTHORS' CONCLUSIONS: The benefits of grommets in children appear small. The effect of grommets on hearing diminished during the first year.

Potentially adverse effects on the tympanic membrane are common after grommet insertion.

Therefore an initial period of watchful waiting seems to be an appropriate management strategy for most children with OME. As no evidence is yet available for the subgroups of children with speech or language delays, behavioural and learning problems or children with defined clinical syndromes (generally excluded from the primary studies included in this review), the clinician will need to make decisions regarding treatment for such children based on other evidence and indications of disability related to hearing impairment.

Reference: Lous J, Burton MJ, Felding JU, Ovesen T, Rovers MM, Williamson I. *Grommets (ventilation tubes) for hearing loss associated with otitis media with effusion in children*. Cochrane Database Syst Rev. 2005;1:CD001801.