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# Australian Journal of Acupuncture and Chinese Medicine

## CALL FOR SUBMISSION OF MANUSCRIPTS

The *Australian Journal of Acupuncture and Chinese Medicine* is the official journal of the Australian Acupuncture and Chinese Medicine Association Ltd. It seeks to foster intellectual endeavour and academic exchange about the research and clinical practice of acupuncture and Chinese medicine and to promote quality in the provision of acupuncture and Chinese medicine clinical services.

The primary focus of the Journal is publishing peer-reviewed articles that will enhance quality and diversity in acupuncture and Chinese medicine clinical practice and/or research and stimulate the exchange of ideas about clinical practice and the role of acupuncture and Chinese medicine in contemporary health care.

Peer-reviewed papers include research articles, clinical trials, systematic reviews, case reports and case series, as well as general and theoretical papers. The Journal also publishes brief reports on current research, book reviews, conference reports and other articles relevant to the Journal's objectives.

Researchers, educators and practitioners in the fields of acupuncture, Chinese medicine and related areas are invited to submit manuscripts to be considered via peer review for publication in future issues of the Journal.

## INSTRUCTIONS FOR AUTHORS

The AJACM Instructions for Authors are printed on pages 46–48 of this issue and can also be downloaded from the Journal's website at www.acupuncture.org.au/ajacm.cfm.

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# Editorial

The *Australian Journal of Acupuncture and Chinese Medicine* was formally inaugurated at the Gala Dinner of the Australasian Acupuncture and Chinese Medicine Annual Conference in Brisbane on 19 May 2007. Professor Charlie Xue of RMIT University officially launched the Journal. James Flowers, AACMA President, and I, as Editor-in-Chief, also spoke at the launch. You can read more about the event and conference in our conference report section. The launch was a very exciting event for AACMA members.

This Journal is the only peer-reviewed English-language journal for Chinese medicine in the South Pacific region. The Editorial Board is committed to publishing high-quality research and clinical papers and to bridging the gap between scientific research and clinical practice. We hope that in ten years this Journal will be one of the most prestigious international journals in the field.

The concept of peer-review is rather new to Chinese medicine in Australia. Some authors have been surprised by the amount of information and detail we require from them, and at how thorough the peer-reviewers and Editorial Board members are at checking the accuracy of information, appropriateness of the methods and quality of the writing. We apply such rigorous criteria to all the articles in this Journal, including not only clinical trial reports, reviews and laboratory reports, but also case reports and general papers. This is the only way to ensure that our publication is of a high quality and will stand the test of time.

Research and practice are not separate entities: they complement each other. Practising Chinese medicine in Australia is a highly demanding job. Our patients are educated and well-informed. Western medicine in Australia is of a high standard and there are many other types of complementary medicine. These factors require us not only to know Chinese medicine comprehensively, but also to be open to modern medical sciences, clinical research methods and the use of evidence, so that we can communicate with our patients and other health professionals. Being thorough, being reflective and being well-informed in practice and research are essential for the Chinese medicine profession to move forward. We hope that this Journal sets an example for all practitioners and researchers in this country.

In the past six months, two major events have happened for Chinese medicine: the establishment of the National Institute of Complementary Medicine (NICM) in June, and the publication of the International Standard Terminologies (IST) for Traditional Medicine in the Western Pacific Region of the World Health Organization (WHO) in August.

The NICM is jointly funded by the Commonwealth and New South Wales governments. Its establishment aims to meet the high demand for complementary medicine from the Australian public. The IST is the final product of four years of work by experts from eight countries. How the IST was developed and its impact on the future of Chinese medicine are discussed in this issue, along with preliminary steps that have been made toward an international standard for single-use acupuncture needles.

Speaking about linking research and practice, in this issue we publish a review paper on the use of ice for musculoskeletal pain, contrasting its use with moxibustion and warm herbs. The author finds limited evidence supporting the commonly used therapy of ice. A case report using moxibustion and acupuncture for an ankle injury also contributes to the discussion on this subject. These two papers illustrate contradictory practices between Chinese medicine and biomedicine and show how evidence can be used to inform and resolve such a situation.

This issue of the Journal also includes a pilot, randomised, sham-controlled clinical trial examining the efficacy of needleless electroacupuncture for osteoarthritis of the knee. The authors find that this type of acupuncture is more effective than the sham control for reducing stiffness and improving physical function.

Turning to herbal medicine research, an animal study finds that a herbal formula decreases aortal plaque induced by a high-cholesterol diet.

Continuing with our international news, the President of the New Zealand Register of Acupuncturists, Paddy McBride, has written a report about the status of acupuncture in New Zealand, while various reports of conferences are also included.

In this issue, we have introduced a new section into our main articles – 'Clinical Commentary'. This includes boxed summaries so that our busy clinicians can more easily extract the key information from our articles.

We will bring you more exciting clinical research reports and other papers in 2008.

*Zhen Zheng*
*Editor-in-Chief*

# Fire and Ice: The Great Debate on the Relative Value of Heat and Ice in Musculoskeletal Therapy – A Narrative Review

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## ABSTRACT

In contemporary musculoskeletal therapy it is common to apply topical cooling agents such as ice, particularly in the context of the RICE (Rest, Ice, Compression and Elevation) protocol. Traditional Chinese medicine (TCM) practice, however, has tended, for two millennia, to use heat rather than cold to treat musculoskeletal injuries, due to the traditional belief that enhancing circulation is likely to be beneficial, while impeding circulation is likely to be deleterious. This narrative review examines the evidence to support the use of ice alone (not as part of the RICE protocol) and the use of heat in the treatment of acute soft tissue injuries, rheumatoid arthritis, osteoarthritis and low back pain. Conclusions: Ice, applied to muscles, appears to have a local anaesthetic rather than an analgesic action. Evidence on the efficacy of ice in reducing oedema is contradictory. Insufficient evidence was found to support the assertion that ice can reduce muscle spasm, however there is evidence that heat can. In rheumatoid arthritis neither heat nor cold showed evidence of benefit. Knee oedema associated with osteoarthritis showed no significant improvement from ice massage, whereas knee oedema following arthroplasty improved with ice packs but not with hot towels. For low back pain there is moderate evidence of significant short-term benefit from heat wraps but insufficient evidence to draw conclusions on the use of cold. Low back pain studies comparing heat and cold yielded conflicting evidence.

KEYWORDS ice, heat, cryotherapy, thermotherapy, musculoskeletal, moxibustion.

## Introduction

Current practice in physiotherapy and sports medicine makes extensive use of ice and other forms of cryotherapy (cooling), not only to treat soft tissue injuries, but also as a pre-exercise and post-exercise therapy to improve performance. Traditional Chinese medicine (TCM), in stark contrast, does not recommend the use of local ice application, and there appear to be no historical references to the use of ice for treating musculoskeletal disorders throughout the 2000-year-long literary tradition. This contradiction in approaches can often leave patients baffled when they visit a physiotherapist, doctor or chiropractor who recommends that they use ice to treat their muscular injury, and then consult an acupuncturist who advises them to use heat and not ice. This debate, which is not short of heated (and icy) opinions, could benefit from examination of the evidence for the effectiveness of heating and

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cooling therapies for musculoskeletal disorders. This review of the research literature will examine such questions as the following:

- What sorts of musculoskeletal disorders benefit from ice or heat (such as soft tissue injury, osteoarthritis, rheumatoid arthritis)?
- When should ice or heat be used (e.g. in the acute inflammatory stage of injury, in sub-acute or chronic cases)?
- On what parts of the body are ice or heat most effective (e.g. ankles, knees, neck, low back)?

The databases searched included ScienceDirect, PubMed, CINAHL Plus with Fulltext, PEDro, Sports Discus, The Cochrane Library and Ovid Full Text. Journals hand-searched in hard copy included *The Journal of Traditional Chinese Medicine* and *The World Journal of Acupuncture–Moxibustion*. The search terms used included: ice, cold, cryotherapy, thermotherapy, heat, musc*, sports injuries, moxa, moxibustion. An initial search found 695 articles, however only 69 of these articles were directly relevant to the treatment of musculoskeletal injury with either cold or heat.

## Fire and Ice: The Philosophical Debate

Given that one of the earliest definitions of health recorded in the *Su wen* was unimpeded circulation of Qi and Blood in the channels and collaterals, it was a natural extension of this concept that therapy should be directed towards enhancing circulation of Qi and Blood. The corollary of this was that Cold was an external pathogen which caused disease by causing contraction, and hence impairment, of the circulation of Qi and Blood. The application of local heat as a therapy with heated stones (*bian* stones), burning twigs and other heat sources appears in the historical medical records before acupuncture and probably predates acupuncture. The *Mawangdui* silk scrolls, for example, buried in a tomb in 168 BC (and presumably old when buried) make reference to moxibustion but not to acupuncture.[1]

One of the earliest concepts of how moxibustion should be used was that heat should be applied to treat disorders caused by cold. In *Su wen*, chapter 12, moxibustion is said to originate from the north of China, where the people of the high plateau consumed a lot of dairy foods (from yak's milk), which were said to produce '*zang* Cold causing fullness'.[2] The author of the *Shang han lun* (*Treatise on cold injury*), Zhang Zhongjing, emphasised that moxibustion was suitable for treating Yin syndromes (Cold), while acupuncture should be used for Yang syndromes (Heat).[3] In this world view, cold was a pathogen while heat was a therapy. Of course, Heat and Fire were also seen as pathogens within TCM theory; however, the therapy was called 'clearing Heat or Fire' and the therapeutic application of local cold does not appear in the historical literature.

With regard to musculoskeletal therapy, Cold was said to make muscles contract while Heat was said to make muscles flaccid (*Ling shu*, chapter 13).[2] Also, the contracting action of Cold was blamed for producing the most painful musculoskeletal disorders such as White Tiger Wind, an extremely painful shoulder disorder where the patient 'wishes to break the arm off and throw it away' (the White Tiger symbolises Cold). Painful Bi syndrome (*tong bi*) is also caused by Cold, and for treating Cold/Painful Bi, moxibustion is strongly recommended (*Su wen*, chapter 43).[2] In TCM, relieving muscle spasm and enhancing local circulation is best achieved by the use of heat, such as moxibustion, and since painful muscle spasm is seen as being caused by cold, the application of ice would be seen as strictly contraindicated.

If TCM theory has been right about the dangers of using local ice application for musculoskeletal disorders, then the predicted long-term outcome of this practice would be an exponential rise in the rates of Cold Bi syndrome as the current generation of sports enthusiasts gets older. Such an epidemiological study in a few decades time may well provide a definitive answer to this ice question – when it is too late. An epidemiological study of ice-cream factory workers suggests that Cold Bi may perhaps be a real hazard. Italian researchers found 'an extremely high frequency of carpal tunnel syndrome (7.1%), epicondylitis (5.2%), and scapulo-humeral periarthritis (3.5%) in the over-35-years age group, with respect to a control population not exposed to the risk.'[4] (Scapulo-humeral periarthritis is also known as White Tiger Wind, a very painful form of Cold Bi syndrome.)

The worldview of the proponents of ice could not be more different. The use of ice to treat musculoskeletal disorders is currently strongly advocated by many sports medicine practitioners and physiotherapists. For example, the clinical practice guidelines of the Association of Chartered Physiotherapists in Sports Medicine (UK) advocate that in the inflammatory stage of an acute sports injury (which the authors nominate as the first 72 hours after acute injury) management should follow the PRICE format – Protection, Rest, Ice, Compression and Elevation.[5] The acute inflammatory phase in characterised by *rubor* (redness), *calor* (heat), *dolor* (pain) and *tumor* (swelling). In modern TCM practice the presence of local redness and palpable heat would constitute a contraindication for moxibustion, but would not necessarily make a case for using ice. The most commonly used 'Heat Clearing' technique used by acupuncturists for acute musculoskeletal injury with redness and heat would probably be non-retaining reducing (*xie*) technique. Other 'Heat Clearing' techniques in acupuncture

include microbleeding techniques, the use of the Ying-Spring points and the Ming Dynasty needle technique, *Tou tian liang* (Spreading Heavenly Coolness). So there is some agreement in treating the inflammatory stage of an acute injury – there is consensus that heat should not be used at this time.

The aims of using ice for the acute inflammatory stage include: to lower the temperature in the tissue, to produce vasoconstriction, to limit bleeding (and hence reduce bruising), to reduce oedema and to stop pain.[6,7]

## Fire and Ice: The Evidence

### ACUTE SOFT TISSUE INJURY

In the area of acute soft tissue injury management, it is common for reviews and clinical practice guidelines to recommend the use of the RICE (Rest, Ice, Compression, Elevation) protocol (or one of its derivatives), especially within the first 72 hours after injury.[5,6,8-11] What is less common, however, is to find research which examines the use of ice alone, rather than in the context of the RICE protocol, for acute soft tissue injuries.

### OEDEMA

The evidence for the influence of ice on oedema is conflicting, with some studies actually showing an increase in swelling after the use of ice.[5] In their clinical practice guidelines, Kerr et al. conclude that 'empirical and biological evidence from animal and human studies seems to refute the notion that cold application reduces oedema. The same evidence is not widely apparent from clinical studies, but this may be because cold application is usually combined with compression and elevation.'[5] The appropriate and timely use of continuous compression has demonstrated unequivocal reduction in oedema due to acute soft tissue injury, and since compression is generally used with ice in the context of the RICE protocol, it is possible that it is compression which is responsible for reducing oedema, not ice.[5,12] In a systematic review of the evidence for the use of cryotherapy alone for acute soft tissue injury, Hubbard and Denegar found that there was little difference between the effectiveness of ice and compression used together and that of compression used alone.[13] Another systematic review by Bleakley, McDonough and MacAuley also found little evidence that adding ice to compression produced any additional benefits.[14] Not all researchers agree on this point. One study on rats has concluded that following contusion of striated muscle, ice can significantly reduce microvascular permeability and the researchers go on to hypothesise that this may in turn reduce leukocyte-endothelial interactions, thus decreasing oedema.[15] Another study, which compared cold, heat and alternating cold and heat to treat oedema on the third, fourth and fifth day after grade 1 and grade 2 ankle sprains, found that only ice therapy significantly reduced oedema.[9]

### PAIN

Researchers have also found varying results for pain, including an initial increase in pain when ice is applied, followed by gradual numbness and then cyclical pain and numbness.[5] Ernst and Fialka, in a review on the use of cryotherapy for musculoskeletal pain relief, concluded not only that there is little evidence for the effectiveness of such therapy, but also that all of the clinical studies reviewed were severely flawed.[16] There appears to be a very close association between local numbness and pain relief, suggesting that perhaps this is not a truly analgesic effect as much as a local anaesthetic effect.[7] Other researchers accept that ice is effective in relieving pain.[5-10] However, some studies have also found that 'ice and compression seemed to be significantly more effective than ice alone in terms of decreasing pain.'[13]

### MUSCLE SPASM

There are some claims that ice can reduce muscle spasm, but no evidence for this claim was found in the literature searched. It has been suggested that cryotherapy may relieve muscle spasm by interrupting the pain–spasm–pain cycle via local stimulation of both nociceptors and proprioceptors; however, no confirmatory clinical evidence has been cited by the authors.[7] There is, nevertheless, good evidence that heat reduces muscle spasm.[6,17,18] The idea that heat relieves muscle spasm is found in the *Ling shu* (as already mentioned), and in the same chapter, cold is said to cause muscles to contract, not relax (*Ling shu*, chapter 13).[2] A surprising historical curiosity is a letter to the editor of *The Lancet* dated 3 January 1828, in which Dr Patrick McIntyre records a case history of successful treatment of muscular contractions of the hand 'cured by moxa'.[19]

### RHEUMATOID ARTHRITIS

Robinson et al. undertook a Cochrane systematic review of thermotherapy for treatment of rheumatoid arthritis.[20] A range of objective measures, including joint swelling, pain, medication use, range of motion, grip strength and hand function, showed no significant change in response to hot packs and ice packs, cryotherapy and wax baths.[20] The affected joints in the seven studies reviewed included hands, knees and shoulders.

In a recent study on rheumatoid arthritis in Hubei, 30 patients were given oral Methotrexate and non-steroidal anti-inflammatory drugs (NSAIDs), while another 30 patients received the same medication plus moxa cones on a slice of aconite (*fuzi*) on ST 36 *Zusanli* and CV 4 *Guanyuan*.[21] The medication plus moxa group showed a significantly greater reduction in NSAIDs dosage and greater symptomatic improvement than the medication only group.[21] While this study is probably the first of its kind and has a relatively small sample size, it does suggest that this style of moxibustion produces systemic improvement. However, what local

effect moxibustion may have remains an open question. An earlier animal study by Wang and Xie also showed an anti-inflammatory effect of moxibustion in experimentally induced adjuvant arthritis in rats.[22]

### OSTEOARTHRITIS

Brosseau et al. conducted a Cochrane systematic review of three studies, of which two involved osteoarthritis of the knee, while the third related to post-surgical rehabilitation after total knee arthroplasty.[23] No significant difference was found between ice packs and control (untuned short wave) in relieving pain.[23] Knee oedema associated with osteoarthritis showed no significant improvement from ice massage; however, post-surgical knee oedema did improve significantly from ten sessions of ice packs.[23] The application of hot towels did not reduce post-surgical knee oedema significantly.[24] Curiously, the reviewers made no comment on whether or not heat was effective in relieving pain or improving range of movement.

### LOW BACK PAIN

A Cochrane systematic review by French et al. compared superficial heat and superficial cold for low back pain, including both acute and sub-acute low back pain.[25] Of nine included studies, only three related to cold treatment, and these were judged to be of such poor quality that no conclusions could be drawn.[25] The reviewers concluded that there is moderate evidence for the effectiveness of heat wraps and heated blankets in reducing pain and disability in the short term.[25] One trial also suggested that adding exercise to heat wraps gave even better pain relief for acute and sub-acute low back pain.[25] Studies making comparisons between cold and heat for low back pain yielded conflicting evidence.[25]

### MOXIBUSTION RESEARCH

Whilst moxibustion is a form of heating therapy, it is not necessarily the case that all forms of heating therapy can achieve the same results as moxibustion. Some specific therapeutic claims have been made for moxibustion which have not been made for any other form of heating therapy. Shen et al. cite research which shows moxibustion to be capable of enhancing 'physiological and immune functions'.[26] Toguchi cites the findings of various Japanese researchers on moxibustion and lists the following therapeutic actions of moxibustion:[27]

- produces histotoxin ('beneficial for neuralgia and rheumatism'),
- regulates intestinal peristalsis,
- promotes local vasodilation and enhances local microcirculation,
- promotes recovery from muscular fatigue,
- increases leucocyte count as well as leucocyte wandering speed and phagocytotic action,
- increases production of erythrocytes and haemoglobin.

Other moxibustion studies (a mixture of animal and human, in vivo and in vitro studies) have also suggested that moxibustion has the following effects:

- anti-inflammatory,[21,22,28,29]
- anti-oxidative,[29-31]
- anti-allergic,[28]
- immune-enhancing.[26-30]

The application of moxibustion in all the above studies was on a selected acupuncture point or points, not locally on the site of a musculoskeletal injury or disorder. So, although some early evidence outlined above does suggest that moxibustion may have an anti-inflammatory action when used systemically, this does not tell us whether local moxibustion is capable of a similar action. Unless further research suggests otherwise, at present it would seem prudent to follow the traditional rule of not using moxa on any local area which is red and hot.

## Summary of research

'More large, well-constructed studies needed' is almost a cliché today in reviews of acupuncture and moxibustion research. However, it appears from the research reviewed above that the same can probably be said of many forms of cryotherapy which are currently in widespread use, and which are recommended in many clinical practice guidelines. While it appears there is good evidence that ice can cause vasoconstriction and reduced temperature in local tissue, the evidence for oedema reduction is contradictory. Ice does produce local numbness but this is not the same as analgesia – it is local anaesthesia.[7] No evidence was found to support the assertion that ice can relieve muscle spasm.

It is noteworthy that the studies which showed the best clinical results for ice tended to be for acute soft tissue injury, especially of the ankles and knees. The quality of studies of ice treatment on the low back was so poor that reviewers were unable to draw any conclusions, and no studies were found involving the use of ice on the neck. This may be because muscular problems of the neck are more often seen in chronic states and most of the clinical practice guidelines for the use of ice restrict its use to the acute inflammatory stage of a soft-tissue injury (nominated by some as the first 72 hours). For acute and sub-acute low back pain, heat wraps and hot blankets were found to be effective in short-term pain relief and reduction of disability. No research was found which evaluates the use of moxibustion alone for low back pain, but this is hardly surprising as moxibustion is usually used in conjunction with acupuncture in the treatment of low back pain.

For rheumatoid arthritis, reviewers found no good evidence of benefit from either heat or cold; however, some moxibustion

studies showed clinical improvements and suggest an anti-inflammatory action for moxibustion (when used on appropriate acupuncture points, not when applied locally). Osteoarthritis of the knee showed no oedema reduction from the use of ice, though post-surgical knee oedema (following total knee arthroplasty) did reduce with ice packs. Osteoarthritis studies involving moxibustion only were not found as this does not reflect current acupuncture practice. Studies of osteoarthritis treated with acupuncture only or acupuncture and moxibustion tell us little about the value of heat therapy alone for this condition.

## Conclusions

Moxibustion is widely used by acupuncturists in conjunction with acupuncture in the treatment of chronic and acute musculoskeletal disorders, except when local redness and heat are present. Ice is widely used (usually in the context of the RICE protocol or one of its variants) by physiotherapists and other sports medicine practitioners for acute soft tissue injury in the acute inflammatory phase. Some also recommend ice to treat chronic musculoskeletal conditions.[6,7]

In sharp contrast, the use of ice has not been included in the historical repertoire of TCM musculoskeletal treatment. Indeed the TCM theory suggests that the use of ice, particularly if prolonged or used in a chronic condition, may even contribute to long-term problems, such as Cold Bi Syndrome, due to impairment of the circulation. At this time there is insufficient evidence to support this prediction.

Time will judge the value of the 'Ice Age' in the history of musculoskeletal medicine.

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## Clinical Commentary

When the evidence to support the use of ice in musculoskeletal disorders is separated out from the commonly used context of the RICE (Rest, Ice, Compression, Elevation) protocol, it has been claimed that ice alone is effective in relieving pain, reducing oedema and relieving muscle spasm.

- The evidence suggests that ice alone has a local anaesthetic rather than analgesic effect.
- There is contradictory evidence for whether or not ice alone can reduce oedema, but it may be that compression is the most effective component of the RICE protocol for oedema, given that, while compression is effective in reducing oedema, the addition of ice to compression shows no additional benefit.
- No evidence was found in the reviewed literature to support the assertion that ice can relieve muscle spasm, although there is consensus in the research that local heat can.

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# Clinical Investigation into the Effectiveness of Needleless Acupuncture in the Management of the Symptoms of Osteoarthritis of the Knee: A Preliminary, Single-blind and Sham-controlled Study

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## ABSTRACT

This single-blind, sham-controlled study investigated the effectiveness of 'needleless acupuncture' in the management of osteoarthritis of the knee. The study employed a Silver Spike Point (SSP) Needle Free Acupuncture Device for administering treatments. Participants were randomly assigned to a treatment or control group (total $n = 36$). Needleless acupuncture (NA) was applied to a standardised group of acupuncture points selected in accordance with traditional Chinese medicine theory and from a range of points used in other similar studies, namely ST 36 *Zusanli*, GB 34 *Yanglingquan*, ST 35 *Dubi* and SP 10 *Xuehai*. Needleless sham acupuncture (NSA) was applied to the same group of acupuncture points by attaching the needle free device, but not providing any electrical stimulation. Interventions for both the active and control groups were applied for a period of 25 minutes in each session. The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) was used to measure changes in knee pain, stiffness and physical activity. Participant blinding was shown to be effective, with no significant trend in either group 'guessing correctly' as to whether they had received real or sham treatment. The comparison of the treatment effects and control condition on WOMAC score was conducted using analysis of variance (ANOVA). The WOMAC scores decreased statistically significantly among participants in the NA group in comparison to the NSA control for all measures: pain of the knee ($p = 0.016$), stiffness of the knee ($p = 0.006$) and difficulty performing daily activities ($p = 0.032$). The results indicate that needleless acupuncture provides an effective, non-invasive alternative for osteoarthritis in the knee.

KEYWORDS needleless acupuncture, knee, osteoarthritis, sham acupuncture.

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## Introduction

This study investigated the clinical effectiveness of needleless acupuncture in comparison to 'sham' acupuncture in managing the symptoms of osteoarthritis of the knee using the Silver Spike Point (SSP) Needle Free Acupuncture Device. The study focused upon one of the seven Australian Government National Health Priority Areas (NHPAs) – 'arthritis and musculoskeletal conditions'.

With an ageing Australian population, limited health resources and lengthened waiting lists for elective surgery, patients with severe osteoarthritis (OA) awaiting knee or hip replacement operations are often prescribed non-steroidal anti-inflammatory drugs (NSAIDs) for extended periods. The gastrointestinal side effects that normally accompany the extended use of NSAIDs, especially for the elderly and frail,[1] raise questions about the appropriateness of such pharmaceuticals. COX-2 inhibitors (such as Vioxx) previously used in the management of osteoarthritic pain have been withdrawn from the market due to unintended negative cardiovascular effects.[2] The identified side effects of NSAIDs and COX-2 inhibitors in the management of pain highlight the need to identify and evaluate viable adjunctive therapies in the management of OA of the knee.[3-5]

A large scale US clinical trial of the effect of acupuncture in treating osteoarthritis of the knee[6] and previous small scale studies suggest that standard acupuncture in which needles are inserted in defined points for approximately 25 minutes is effective in providing pain relief without undesirable side-effects.[7-13] These findings are supported by an extensive longitudinal audit of patients who received acupuncture as an adjunct therapy in the treatment of osteoarthritis of the knee.[14] The current study builds upon the existing research by examining the effectiveness of the SSP Needle Free Acupuncture Device in treating the symptoms of osteoarthritis of the knee.

In addition, randomised clinical trials (RCTs) by Haslam and Ng[15] indicate that acupuncture may be more effective than advice and patient education in the symptomatic relief of OA pain. Research into the neurological and physiological effects of acupuncture has shown that by producing rhythmic discharges in nerve fibres and releasing β-endorphins, acupuncture reduces pain and decreases stress level markers.[16,17] By altering dopaminergic and serotonergic systems in a way that correlates with anti-stress markers,[17] it is arguable that, in addition to pain relief, acupuncture has a broader effect on general wellbeing. These findings, when considered in the context of the deleterious psychological effects of pain,[18] add to the significance of this study.

The aim of this preliminary study was to explore the benefits of needleless acupuncture (NA) in comparison to needleless sham acupuncture (NSA) in the management of the symptoms of OA of the knee. In particular this controlled, single-blind study measured the effectiveness of NA in decreasing OA knee pain and improving knee joint movement and function. The effectiveness of the SSP has been previously demonstrated in clinical studies of paediatric enuresis[19] and this study was based on the premise that the device would also be beneficial in the treatment of adult osteoarthritis of the knee. In the treatment of OA of the knee, the researchers undertaking this study believed that the needle-free approach could provide a useful alternative to standard acupuncture for those patients who were needle-phobic or had a low pain threshold.

From a theoretical perspective, it is suggested that by using a small electrical current delivered in precise fashion on an acupuncture point, Qi circulation is stimulated and blockages in the channel are diminished. The SSP therapy is a recognised form of needle-free electroacupuncture (EA) and has been shown to have similar analgesic effects to needle EA, being reportedly superior to TENS according to practitioners and researchers' experience.[22] SSP is an advanced form of low-frequency electrical therapy that was developed in 1976 in Japan as a joint academic industrial study between Osaka Medical College (Department of Anaesthesiology) and Nihon Medix Company Limited, one of Japan's leading medical equipment manufacturers. SSP therapy stimulates the analgesic effect of needle electroacupuncture, without using needles. Low-frequency treatment, using SSP therapy has been found to provide effective pain relief. The therapy also has the added benefits of being simple to apply, non-invasive, free from side effects, and with no limit to the number or duration of treatments. There are two features unique to SSP that set it apart from needle electrotherapy and TENS. These are: the distinctive SSP electrode and the 1/f yuragi frequency fluctuation system.

SSP electrodes were designed to allow practitioners to achieve comparable results to needle electroacupuncture while eliminating the disadvantages of using needles.[22,23] The electrodes are manufactured from silver-plated brass to ensure reliable transference of the electrical stimulation. The electrode's conical shape enables both deep and peripheral stimulation to a wide range of treatment points on the body. The electrodes are housed within a rubber cup where an adjustable vacuum mechanism maintains contact with the skin. The vacuum facilitates compression of the electrode against the skin surface for constant electrical stimulation.

To ensure comfortable treatment with unrestricted placement of paired electrodes, SSP treatment utilises spike waves and bi-directional waveforms. Nihon Medix introduced 1/f yuragi

fluctuated, irregular pulse stimulation into low-frequency electrical therapy, based on research from a number of studies.[24,25] It reported marked benefits of 1/f yuragi compared to regular electrical stimulation, especially for 'difficult to treat' pain. The most comfortable waveforms, such as the relaxed alpha rhythm of an electroencephalogram and classical music, conform to the 1/f yuragi fluctuation pattern.

According to the Nihon Medix SSP Operational Manual (Felicia Trimix, Instruction Manual, 1977), SSP needle-free electroacupuncture can offer many superior benefits to needle acupuncture, such as:

- No hazardous waste (environmentally friendly);
- No risk of the contraindications or complications associated with needle use;
- No skin penetration, thus ensuring pain-free, needle-free treatment and reduced danger of infection or contagion;
- SSP EA is also suitable for hypersensitive patients, young children and the elderly.

Research concerning the SSP needle-free acupuncture device has not previously been undertaken in Australia and certainly no studies have been undertaken on the benefits of the device in treating OA of the knee. Potential treatment benefits associated with the device in the Australian context for specific population groups and conditions is warranted.

# Methods

This single-blind study drew upon the methodology of a large-scale American RCT that compared the relative effects of acupuncture (active group) and sham acupuncture (control group)[6] using standardised groupings of needle insertion sites. A group of persons living in the western suburbs of Melbourne, Australia, who had been diagnosed by a medical practitioner as having a moderate level of OA of the knee (i.e. prescribed some form of pain-relieving medication for the condition), were recruited with the assistance of health professionals. Consenting participants were paired according to the level of OA pain (indicated by the WOMAC score), age and gender. Participants were then randomly allocated to the NA or NSA group according to the order of recruitment, and were not informed of whether they were receiving NA or NSA until after the completion of the study. Treatments were administered twice weekly by a qualified and registered acupuncturist for a period of three weeks. Participants were asked to keep the acupuncturist informed if there was any change of their medical treatment related to OA. Based on a review of small-scale studies[20] that used standard acupuncture to treat OA of the knee, this preliminary study aimed for a total sample of 40 participants, with 20 in each group. Those in the control group were offered the opportunity of a free course of treatment after the completion of the study. Figure 1 shows the flow of participants through each stage of the trial.

## INCLUSION CRITERIA

Participants were included if they were diagnosed by a medical practitioner as having a moderate level of OA of the knee and prescribed some form of pain relieving medication.

## EXCLUSION CRITERIA

Participants were excluded if they had another disease affecting the knee (e.g. connective tissue, neurological, etc.); wore any biomedical-electrical devices (e.g. pacemaker, hearing aid); had acupuncture, moxibustion or TENS for OA of the knee during the previous three months; or were unable to understand instructions or give consent.

Prior to commencing the study the protocol was approved by the Human Research Ethics Committee at Victoria University and participants signed an informed consent.

## OUTCOME MEASURES AND ANALYSIS

In accordance with accepted outcome measures in other studies,[6,10,15] this clinical trial utilised the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), which is validated for use in Australia by this research group under licence. The WOMAC measures pain, stiffness of the knee and difficulty performing daily activities and was administered before the commencement of the study, mid-study (1.5 weeks after commencement) and at the conclusion of the three-week treatment period. It is a 0–10 scale, with 0 being no pain or no knee stiffness or no difficulty performing daily activities, and 10 being most severe pain, stiffness or difficulty performing daily activities. Participants in the treatment and control groups were asked to report any adverse events that could have been related to treatment.

The data collected from the WOMAC scale were analysed statistically and reported in 'participant de-identified' numerical form. Scores from pre-testing, 1.5-weeks and 3-weeks were compared for the treatment and control conditions using analysis of variance (ANOVA, General Linear Model). Post-hoc analyses were conducted with Bonferroni corrected t-tests. All data collected during the course of the study were coded and kept in a locked filing cabinet to ensure participant confidentiality and privacy of information.

## INSTRUMENTATION

A needleless acupuncture point stimulator (SSP Needle Free Acupuncture Device, Felicia Trimix TM21, manufactured by Nihon Medix Co. Ltd, Japan) was used. The SSP Needle Free Acupuncture Treatment machine is approved by the TGA for sale and use as a therapeutic device in Australia

(TGA approval number L68571), being tagged and approved according to Australian Standards. In the NA group, needleless acupuncture was applied to a standardised group of acupuncture points selected in accordance with traditional Chinese medicine (TCM) theory and from points used in other studies of osteoarthritis of the knee.[6,8] Selected treatment points were: ST 36 *Zusanli*, GB 34 *Yanglingquan*, ST 35 *Dubi* and SP 10 *Xuehai*. These points were selected on the basis of TCM practice as points commonly used in the treatment of OA of the knee. The researchers recognised that according to TCM theory, it would be more beneficial if points were selection in each treatment in accordance with the specific pattern of disharmony. However, a set formula was chosen in this study to minimise the degree of variables in this small-cohort, preliminary investigation. Mixed mode low-frequency treatments (3 Hz/4 s, 10 Hz/4 s and 20 Hz/4 s) were used in this study as experience suggests that this setting is optimal in producing an analgesic effect.[22,24,25] The intensity of the stimulation was set at the level where individual participants considered it comfortable.

In the NSA group, the same group of acupuncture points were applied with SSP but without electrical stimulation. The interventions for each group lasted 25 minutes in each treatment session, as this has been suggested as the optimal period for treatment.[6,7,21]

## Results

Forty applicants were assessed for eligibility. One applicant refused to commence the study as he wanted to know to which group he was assigned and refused to be in the control group if he was assigned to it. Three participants were excluded before commencing the study as their level of pain was beyond the moderate level as inclusive criteria required. Four participants withdrew from the study between the first and the fourth treatment as they did not feel the therapeutic effect (see Figure 1). Thirty-two (mean age = 59.91 ± 12.70 years) completed the trial, 16 in the NA group and 16 in the NSA group; 22 were female and 10 were male. None of the participants who completed this study changed their medical treatment during

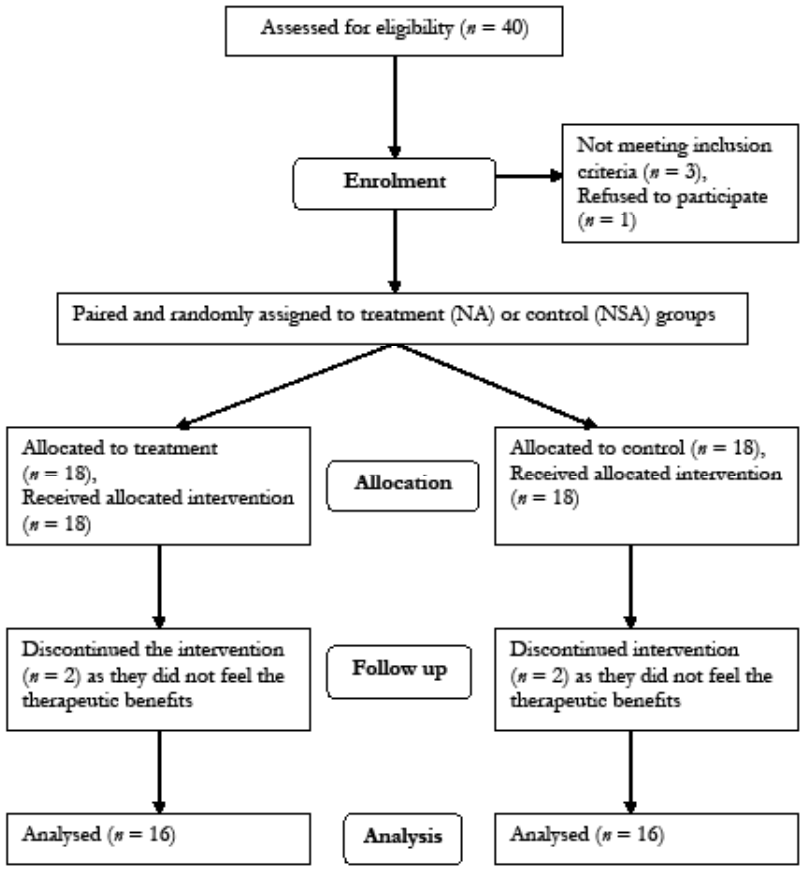


FIGURE 1 Flow chart of participants through each stage of the trial

TABLE 1 WOMAC scores of pain, stiffness and difficulty performing daily activities, from baseline to three weeks (mean ± SD)

| Groups | | Needless acupuncture (NA) ($n$ = 16) | Needless sham acupuncture (NSA) ($n$ = 16) |
|---|---|---|---|
| WOMAC pain scores | Baseline | 3.02 ± 1.60 | 3.78 ± 2.17 |
| | 1.5 weeks | 3.22 ± 2.28 | 3.94 ± 1.83 |
| | 3 weeks | 1.83 ± 1.60* | 3.89 ± 2.46 |
| WOMAC stiffness | Baseline | 4.77 ± 2.49 | 4.44 ± 3.25 |
| | 1.5 weeks | 4.63 ± 2.28 | 4.13 ± 2.82 |
| | 3 weeks | 2.55 ± 1.79* | 4.34 ± 3.01 |
| WOMAC difficulty performing daily activities | Baseline | 4.28 ± 2.11 | 4.48 ± 2.40 |
| | 1.5 weeks | 3.66 ± 2.15 | 4.43 ± 2.28 |
| | 3 weeks | 2.41 ± 1.74* | 4.11 ± 2.17 |

* Statistically significant difference between NA and NSA (Bonferroni corrected t-tests, $p < 0.008$).

the course of the study. The two treatment groups were comparable in their age and WOMAC scores.

The mean WOMAC scores are presented in Table 1. The NA group had statistically significant reduction in pain of the knee ($F(2,60) = 4.56$, $p = 0.014$), stiffness of the knee ($F(2,60) = 5.54$, $p = 0.006$) and difficulty performing daily activities ($F(2,60) = 3.66$, $p = 0.032$) in comparison to the NSA. Post-hoc t-tests showed that the two groups were statistically significantly different at week three. Compared with baseline, in the NA group at the end of the three-week treatment the average pain score had decreased by 61%, knee stiffness score by 53% and difficulty performing daily activities score by 56%. There were no significant changes in WOMAC scores for participants in the control group. There were no adverse events reported.

Participants in the study were asked whether they believed that they had received real or sham treatment. In the NA group five participants guessed correctly, while the other 11 were unclear about which group they belonged to. In the NSA group, five participants thought they were actually in the treatment group and the other 11 were unclear about which group they belonged to (Table 2). The results indicated that blinding in the study was reasonably effective and therefore participants' beliefs about group status did not appear to have a significant bearing upon the results.

## Discussion

This preliminary study showed that the SSP Needle Free Device was effective in treating the symptoms of osteoarthritis of the knee. Pain and knee stiffness and participants' daily physical ability improved significantly in the NA (active acupuncture) group by the end of the study, but not at the 1.5-week period. There was no significant change in these scores for the NSA (control) group.

As described in the results, some applicants did not understand the nature of this clinical trial and withdrew from the study at an early stage of the study. This indicates that public awareness of clinical research and acupuncture is still limited.

TABLE 2 Participants' belief as to whether they had received real or sham acupuncture

| Groups | Guessed correctly the group they were in | Guessed incorrectly the group they were in | Did not know whether they were in group A or B |
|---|---|---|---|
| Active acupuncture (A) ($n$ = 16) | 5 | 0 | 11 |
| Sham acupuncture (B) ($n$ = 16) | 0 | 5 | 11 |

The participants were paired firstly according to the level of OA pain in the knee and then further stratified according to age and gender, and then randomised into the NA treatment and the NSA control group. This method was chosen to reduce the differences between the two groups at the commencement of the experiment. If future studies of this kind were conducted using a bigger sample size, a full randomised grouping without pairing participants would be possible. As it is essential to have qualified acupuncturists to conduct the intervention (treatment or control), a single-blind method was considered to be appropriate for this clinical trial.

The dose level of needleless acupuncture stimulation in the study was set at the level wherein individual participants indicated a comfortable stimulation level during each treatment session. We noticed that the level was continuously increasing for most of the participants toward the end of the study, as the pain was decreasing. The detailed data of the stimulation levels are suggested to be recorded in future studies.

Arguably, the needle-free approach provides a useful alternative to standard acupuncture for patients who are needle-phobic and/or have low pain thresholds. The effective treatment duration suggested by this study is three weeks. The device is easy to operate. However, to avoid incorrect diagnosis and inappropriate and/or detrimental treatment, it is imperative that a qualified acupuncturist operate the SSP Needle Free Device.

As the Australian population ages, a higher proportion of the population will suffer from degenerative diseases such as osteoarthritis in weight-bearing joints such as the knee. Persons with OA of the knee have substantial pain levels, which are normally treated with pharmacological agents, all of which have side effects of varying severity. Chronic pain, loss of mobility and the side-effects of pain-relieving pharmaceuticals impact negatively upon quality of life and arguably contribute to depression and anxiety. While the researchers undertaking this study were not able to locate information that quantified the cost of OA of the knee to the Industry, Employers or National Health Budget, it is clear that this study has demonstrated an inexpensive, drug-free, alternative treatment for this condition.

Acupuncture has the potential to relieve pain, increase mobility, improve the quality of life and possibly reduce patient dependence upon pharmacological agents. A recent large-scale randomised clinical trial of 570 subjects with OA of the knee concluded that standard acupuncture was more effective than sham acupuncture (the insertion of acupuncture needles on non-acupuncture points) in reducing pain and increasing knee joint mobility.[6] Similarly, this preliminary study employing an SSP Needle Free Acupuncture Device, demonstrated positive outcomes for participants in the active acupuncture treatment group. Arguably this needle-free approach has benefits for patients who have difficulties with traditional acupuncture needling and at the same time are interested in a non-pharmacological approach to treating osteoarthritis of the knee.

## Conclusion

Based on the differences in WOMAC scores between participants in the active acupuncture treatment and control groups, pre- and post-intervention, this study showed that needleless acupuncture is effective in treating the symptoms of osteoarthritis of the knee. The study has also shown that in addition to traditional acupuncture, trained acupuncture practitioners have another valid non-pharmacological approach to treating OA, which is commonplace in Australia's ageing population.

## Acknowledgments

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## Clinical Commentary

The research showed that the SSP Needle Free Device was therapeutically beneficial and as such offered an alternative to standard acupuncture in clinical practice. Arguably, the device has particular clinical benefits in the treatment of patients who are needle-phobic, prone to 'needle shock' and/or have low pain thresholds. The device is easy to operate. However, as with all electrical stimulators, the device should not be used with patients who have electrical implants in order to prevent any possible interference. It is imperative that the SSP Needle Free Device is operated by a qualified acupuncturist in order to ensure appropriate application, avoid incorrect diagnosis or treatment, and provide optimal therapeutic benefit.

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# Effect of a Herbal Formula Consisting of Leech, Dahuang and Chinese Cassia Bark on Diet-induced Atherosclerosis in Rabbits

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## ABSTRACT

Atherosclerosis is a common condition with slow build-up of plaque on the inside wall of arteries. This study was undertaken to investigate whether a herbal formula consisting of three traditional Chinese medicines, including leech (*Shuizhi*, *Whitmania pigra* Whitman), *Dahuang* (medicinal rhubarb, *Rheum palmatum* L., Polygonaceae), and Chinese cassia bark (*Guipi*, *Cinnamomum cassia* Blume, Lauraceae) had beneficial effects on diet-induced atherosclerosis in rabbits. This herbal formula has been traditionally used to treat symptoms presented in stroke and ischaemic heart disease by Chinese doctors for more than 2000 years. Experimental atherosclerosis was established by feeding New Zealand white rabbits (*Oryctolagus cuniculus* L.) with a high-cholesterol diet for 10 weeks. The study demonstrated that the high-cholesterol diet resulted in significantly thickened aortic intima, enhanced intima area (with a total plaque area of 46.87%), marked apoptosis in plaques, elevated plasma levels of total cholesterol, triglyceride, high density lipoprotein (HDL-C), low density lipoprotein (LDL) and malonyldialdehyde (MDA), and significantly increased aortal ceramide content and sphingomyelinase (SMase) activity at the end of the 10-week period. Treatment of the atheromatous rabbits with the compound herbal formula at 1.5 g/kg significantly decreased the area of aortal plaque (to 28.62%) and apoptosis, and brought down the increased plasma MDA levels, aortal SMase activity and ceramide content to normal levels. These results suggest that the compound herbal formula has inhibitory effects on the development of atheromatous plaques in rabbits, probably through anti-oxidative effects and inhibition of apoptosis and ceramide production.

KEYWORDS atherosclerosis, apoptosis, ceramide, leech, *dahuang*, *guipi*, *Whitmania pigra*, *Cinnamomum cassia*, *Rheum palmatum*.

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# Introduction

Diseases caused by atherosclerosis are the leading cause of illness and death in many countries.[1-3] Atherosclerosis is characterised by clogging, narrowing and hardening of medium-sized and large arteries, due to slow build-up of fatty deposits (plaques) on the inside walls of the arteries; these plaques are made up of fat, cholesterol, calcium, and other substances found in the blood.[2,3] Atherosclerosis can cause serious complications, including stroke, heart attack, eye problems and nephropathy.[1,4] The risk factors for atherosclerosis include high blood pressure, smoking, diabetes, obesity, hyperhomocysteinemia, inflammation and hypercholesterolemia.[3,4] High blood cholesterol can modify the biochemical properties of blood components and arterial intima, promoting the progression of atherosclerosis.[2] In addition, increased oxidative stress within the vasculature, manifested by the accumulation of oxidised lipids and proteins, as well as the formation of reactive oxygen species, is commonly considered to play a key role in the initiation and progression of atherogenesis.[5] Sphingomyelinases (SMases) represent central elements of the so-called sphingomyelin/ceramide signalling pathway.[6,7] They play an important role in induction of cell proliferation, apoptosis, and cell activation, which are considered key events in atherogenesis. Stimulation of SMase activity produces ceramide, which has been shown to play an important role in oxidative, stress-mediated vascular endothelial cell apoptosis, which is involved in the development and progression of atherosclerosis.[8]

To help slow or reverse atherosclerosis, various medicines are needed to lower blood cholesterol (e.g. statins) and blood pressure (antihypertensives), and prevent clot formation, as well as blockade of blood flow (anticoagulants and antiplatelet agents).[9-11] Recently, novel therapeutic targets for atherosclerosis have been implicated, including those mediators and signalling molecules associated with angiogenesis and inflammation.[10,11] Despite the wide use of synthetic drugs, a number of herbal remedies are also used by many patients to lower cholesterol and treat atherosclerosis because of low cost, cultural tradition and wide availability.[12] Some herbal medicines, including *Danshen* (*Salvia miltiorrhiza* Bunge, Lamiaceae), *Yunzhi* (*Coriolus versicolor* (L. ex Fr.) Quél., Poriceae), and *Amirkabiria odoratissima* Mozaffarian (Umbelliferae), have been shown to have inhibitory effects on atherosclerosis progression in animal studies.[13-19] However, there is scant knowledge on their efficacy, mechanism of action and toxicity.

The herbal formula consisting of leech (*Shuizhi*, *Whitmania pigra* Whitman), *Dahuang* (medicinal rhubarb, *Rheum palmatum* L., Polygonaceae) and Chinese cassia bark (*Guipi*, *Cinnamomum cassia* Blume, Lauraceae) has been traditionally used to treat stroke and acute and chronic heart disorders by Chinese doctors for more than 2000 years.[20] The therapeutic use of leeches and *Dahuang* for salving ischaemic tissues in Oriental medicine dates back to 50 BC.[20] *Dahuang* as used in this formula is medicinal rhubarb (*Rheum palmatum* L., Polygonaceae), which is listed in the Chinese Pharmacopoeia. The Pharmacopoeia also lists *Rheum tanguticum* Maxim. ex Balf. and *Rheum officinale* Baill. under *Dahuang*. Leech (*Shuizhi*, *Whitmania pigra* Whitman, listed in the Chinese Pharmacopeia) demonstrates wide pharmacological effects, such as anti-platelet agglomeration and the decrease of blood lipids. It is frequently prescribed by traditional Chinese medicine doctors due to its conspicuous therapeutic effects, such as removing blood stasis and promoting blood circulation. In the clinic, it is widely used to treat cerebrovascular and other diseases. Active protein and amino acids are the major components of leeches. In particular, the leech saliva contains a peptide called hirudin, which is a direct thrombin inhibitor and a highly effective anticoagulant.[21] This study was undertaken to investigate whether the herbal formula of leech, *Dahuang* and *Guipi* had inhibitory effects on the atherosclerotic lesions in rabbits and the possible underlying biochemical mechanism for such effects.

# Methods

## CHEMICALS AND REAGENTS

2-Thiobarbituric acid and ceramide were purchased from Sigma-Aldrich Chemical Co. (St Louis, MO). Ultrapure water was prepared using a Milli-Q purification system (Barnstead International Inc., Dubuque, IO). Other chemicals and reagents were of analytical grade as appropriate. The extracts for the formula, which consisted of three traditional Chinese medicines – dried leeches, rhubarb, and Chinese cassia bark – were obtained in powder form from Guangdong Yifang 1st Pharmaceutical Factory (Guangzhou, China) and were produced to the standard of Good Manufacturing Practice. The ratio of the three traditional medicines in the mixture was 3:2:1. All these traditional medicines are registered in the Chinese Pharmacopoeia 2005 (www.sfda.gov.cn).

## ANIMALS

Healthy male New Zealand rabbits (*Oryctolagus cuniculus* L.) (weight = 1.8 ± 0.3 kg, age = 5–6 months) were purchased from the Experimental Animal Center of Sun Yat-sen University, Guangzhou, China. The study proposal was approved by the Research Ethics Committee of Sun Yat-sen University. Animal experiments were performed in accordance with the Guide for the Care and Use of Laboratory Animals as adopted and promulgated by the United States National Institutes of Health.[22]

## DIET-INDUCED ATHEROSCLEROSIS AND DRUG ADMINISTRATION

Male New Zealand rabbits ($n$ = 8 in each group) were randomly divided into three groups: Group I (the blank control, fed with

standard rabbit chow (Purina Mills Inc., St Louis, MO)); Group II (treated with the control vehicle only, fed with standard rabbit chow containing 1% cholesterol); and Group III (treated with the herbal formula at 1.5 g/kg, fed with standard rabbit chow containing 1% cholesterol). The control vehicle contained powdered starch only. The animals were kept in a room under controlled temperature (22 ± 1°C), with an automatic day–night rhythm (12-hour cycle); they were housed in individual cages. The animals were fed fresh diets daily with free water access and their body weights were monitored regularly. The feeding amounts for each rabbit were limited to 135–150 g per day and the herbal mixtures were mixed in well with the feed. The dosage of the dried compound herbal formula was 1.5 g/kg body weight per day. This dosage was calculated based on the clinical dosage, with mean rabbit body weight about 1.8 kg. After 10 weeks of the experiments, the rabbits were anaesthetised with pentobarbital sodium at 50 mg/kg body weight by intraperitoneal injection. Blood was collected from the heart of each animal into a clear tube treated with heparin. Plasma was obtained by centrifugation at 1500 *g* for 8 min at 4°C. The animals were then sacrificed with the method of air embolism as described previously (a bolus of air at ~15 mL/kg in 5 s through the femoral vein).[23] Thoracic aortas were opened longitudinally and the inner surface was traced onto graph paper, with atheromatous plaques delineated.

## MICROSCOPIC DETERMINATION OF PLAQUE AREA IN AORTAS

The numbers of small squares of the inner surface of aortas and areas surrounded by lines were counted using the National Institutes of Health plaque counting method.[24] Sections of the aortic sinus region were examined using light microscopy at 40× magnification with an Olympus BX60 optical microscope (Olympus Optical Co., Hamburg, Germany), and the cross-sectional area of lipid depositions was quantified using image-analysis software (Image ProPlus-4, Scitech).

## TERMINAL DEOXYNUCLEOTIDYL TRANSFERASE-MEDIATED BIOTINYLATED UTP NICK END LABELLING (TUNEL) ASSAY

The TUNEL assay was performed in formalin-fixed and paraffin-embedded rabbit aortal tissue slides by using an apoptosis detection kit (DeadEnd Fluorometric TUNEL System, Promega, Madison, WI) according to the manufacturer's instructions. This system detects the fragmented DNA of apoptotic cells by catalytically incorporating fluorescein-12-dUTP at 3'-OH DNA ends using the terminal deoxynucleotidyl transferase (TdT). The fluorescein-12-dUTP-labelled DNA can then be visualised directly by fluorescence microscopy. An apoptosis index was obtained by counting the TUNEL positive cells. Results are means from three individual slides of the aortal tissue collected from at least six animals per experiment by counting 200 cells each slide.

## MEASUREMENT OF PLASMA LIPIDS

The rabbit plasma levels of total cholesterol (TC), triglyceride (TG), high density lipoprotein-C (HDL-C) and low density lipoprotein (LDL) were detected by the enzyme method or one-step method as described previously using the Dimension RxL Chemistry Analyser (Dade Behring Diagnostics, Sydney, Australia) and relevant commercial kits (Boehringer Mannheim GmbH).[25] Lipoproteins were separated by a single density gradient ultracentrifugation for 18 hours at 21°C,[26] using 1 mL of rabbit plasma. The density gradient solution contained 0.25 mM EDTA and 0.1 mM butylated hydroxytoluene. Plasma lipids were extracted using 2.5 mL chloroform/methanol (2:1, v/v), vortex-mixed, and centrifuged at 1000 *g* for 15 min.[27] The lower phase of the Folch extract was evaporated under nitrogen and the lipids were then analysed. Cholesterol and triglyceride concentrations in plasma were expressed as millimoles per liter (mmol/L). Plasma protein concentrations were determined using the Lowry method.[28]

## DETERMINATION OF SUPEROXIDE DISMUTASE (SOD) ACTIVITY AND MALONYLDIALDEHYDE (MDA)

Superoxide dismutase (SOD) – one of the most important anti-oxidative enzymes – catalyses the dismutation of the superoxide anion ($O_2^-$) into hydrogen peroxide and molecular oxygen. Plasma SOD activity was detected using a commercial kit SOD-525 (Oxis International Inc., Foster City, CA) by testing the rate of autoxidation of 5,6,6a,11b-tetrahydro-3,9,10-trihydroxybenzo[c]fluorene (BXT-01050) in aqueous alkaline solution (pH 8.8) at an absorbance wavelength of 525 nm.[29] Briefly, the incubation was performed at pH 8.8 in 50 mM air-saturated 2-amino-2-methyl-1,3-propanediol buffer containing 3 mM boric acid and 0.1 mM diethylenetriaminepentaacetic acid at 37°C. The kinetic measurement of 525-nm absorbance was performed for 1 min upon addition of BXT-01050. The SOD activity was determined from the ratio of autoxidation rates measured in the presence and absence of rabbit plasma sample. One SOD activity unit was defined as the activity that doubles the autoxidation background.

Plasma content of MDA was measured by the 2-thiobarbituric acid method.[30] MDA is widely used as an indirect marker of lipid peroxidation. In brief, an aliquot of 1.0 mL rabbit plasma was pipetted into a screw-cap tube and mixed with 1.0 mL of 0.8% aqueous 2-thiobarbituric acid at final pH 0.9. The reaction mixture was then incubated for 30 min at 70°C with gentle agitation, cooled in an ice bath for 5 min, and tempered for 45 min at room temperature. Thereafter, the sample was analysed by third-derivative spectrophotometry (Shimadzu UV-160A) at 521.5 nm against a blank containing 1.0 mL of 5% aqueous trichloroacetic acid and 1.0 mL of 0.8% aqueous 2-thiobarbituric acid. Spectrophotometric conditions were set as follows: spectrum range, 400–650 nm; scan speed, 480 nm/min; and derivative difference setting ($\Delta\lambda$), 21 nm. The

2-thiobarbituric acid values (expressed as nmol of MDA per millilitre of plasma protein) were calculated on the basis of the calibration curve ($Y = 4.90 \times 10^{-3} + 9.01 \times 10^{-3} X$, where Y is peak height at 521.5 nm expressed in arbitrary units, as printed on the instrument chart, and X is the MDA concentration in nmol/mL of reaction mixture). All procedures were performed in attenuated light conditions.

### DETERMINATION OF AORTAL SPHINGOMYELINASE (SMASE) ACTIVITY AND CERAMIDE CONTENT

The rabbit aortal samples were weighed and homogenised in 10 vol of chloroform-methanol 1:1 using a Polytron (Brinkmann Instruments Inc., Westbury, NY). The homogenate was filtered through a sintered glass funnel. The aortal SMase activity was determined using the radio-labelled enzyme tracing method as described previously.[31] In brief, 10 µL of collected rabbit aortal sample was added to the tubes followed by 50 mM Tris-HCl buffer (pH 9.0) containing 0.15 M NaCl, 2 mM EDTA, 10 mM taurocholate, 0.1 mM sphingomyelin, 2.0 µM [14C]-sphingomyelin (~20 000 dpm) to a final volume of 500 µL. After incubation at 37°C for 30 min, the reaction was terminated by adding 0.4 mL of chloroform-methanol (2:1, v/v) followed by centrifugation at 3000 *g* for 15 s. An aliquot (100 µL) of the upper phase containing the cleaved phosphocholine was analysed for radioactivity by liquid scintillation. The activity was expressed as nmol/h/mg in the upper phase after 30 min incubation.

The aortal ceramide content was determined using thin-layer chromatography as described previously.[32] Briefly, a total lipid extract was prepared according to Bligh and Dyer[27] and applied on Silica gel plates (60 F, 0.25 mm) for thin layer chromatography. The plates were developed by chloroform-methanol-25% ammonium hydroxide (65:25:4, v/v/v) and the lipid bands were visualised with iodine vapour. Only bands migrating with Rf values of known standards were quantified. Ceramide was developed with hexane-chloroform 1:1 followed by chloroform-methanol-acetic acid (91:2:3, v/v/v). Ceramide bands were visualised by charring, using a copper sulfatephosphoric acid reagent, and band density determined using a Bio-Rad 620 videodensitometer and 2-D Analyst software (Hercules, CA). Ceramide levels were normalised to phospholipid phosphate and are presented as means ±SD (pmol/nmol lipid phosphate) from at least three independent determinations.

### STATISTICAL METHODS

Data are expressed as mean ±SD and were analysed using SPSS 10 (SPSS Inc., Chicago, IL). The statistical analysis to evaluate the differences in the mean parameters among the different groups was conducted by a one-way analysis of variance (ANOVA), followed by a post-hoc test (Dunnett's multiple comparison test). For multi-group comparison, the significance level ($p$) was set at 0.05 divided by the number of comparisons.

## Results

Rabbits in all groups ate all of their chow during the period of the study, and showed gradual increases in body weight and serum lipid concentrations (Table 1). Statistically, no significant differences were seen in body weight among the three groups at the end of the study and the average body weights of the animals in Groups I, II, and III were 3.2 ± 0.4, 3.6 ± 0.5, and 2.9 ± 0.5 kg, respectively. The high-cholesterol diet resulted in significantly thickened aortic intima, and enhanced intima area, with significantly increased apoptotic cells (58%). The apoptotic cells (mainly macrophages and some muscle cells) had condensed chromatin along the nuclear membrane and shrunken nuclei.

Feeding of rabbits with a high-cholesterol diet for 10 weeks significantly increased plasma levels of TC, TG, HDL-C, and LDL (Table 1). The plasma TC level was increased from 1.66 ± 0.88 mmol/L in rabbits fed with standard chow to 38.23 ± 13.82 mmol/L when rabbits were fed with the high-cholesterol diet ($p < 0.001$). The plasma TG level was only moderately increased in rabbits fed with the high-cholesterol diet compared to rabbits fed with standard chow (1.31 ± 0.37 vs 0.86 ± 0.33 mmol/L, $p < 0.05$). Notably, the plasma LDL concentration was dramatically increased (205-fold) in rabbits fed with the high-cholesterol diet compared to rabbits fed with standard chow (0.23 ± 0.03 vs 47.25 ± 15.21 mmol/L, $p < 0.001$).

In contrast, the plasma level of SOD was significantly decreased in rabbits fed with the high-cholesterol diet compared to rabbits fed with standard chow (89.78 ± 23.73 vs 197.57 ± 28.87 U/mL, $p < 0.05$). Consistently, the plasma MDA level in rabbits fed with the high-cholesterol diet was significantly increased compared to rabbits fed with standard chow (17.29 ± 5.13 vs 9.28 ± 3.33 nmol/L, $p < 0.05$).

The high-cholesterol diet also significantly increased aortal SMase activity in rabbits compared to rabbits fed with standard chow (1.38 ± 0.35 vs 0.27 ± 0.02 nmol/h/mg tissue, $p < 0.01$). In addition, the aortal ceramide level in rabbits fed with the high-cholesterol diet was significantly increased compared to rabbits fed with standard chow (10.01 ± 2.04 vs 4.03 ± 0.73 pmol/nmol lipid phosphate, $p < 0.01$).

Treatment of the atheromatous rabbits with the compound herbal formula consisting of leech, *Dahuang* and *Guipi* at 1.5 g/kg for 10 weeks significantly decreased the area of aortal plaque (from 46.87% to 28.62%) and endothelial apoptosis (from 52% to 28%). However, the herbal formula only slightly

TABLE 1 A comparison of various parameters for rabbits fed on three different diets (mean ±SD of 8 animals per group)

| Parameter | Group I (Standard diet) | Group II (High-fat diet) | Group III (High-fat diet + herbal formula) |
|---|---|---|---|
| Body weight | 3.2 ± 0.4 | 3.6 ± 0.5[a] | 2.9 ± 0.5[b] |
| Area of plaques (%) | 0 | 46.87±15.56[a] | 28.62 ± 13.29[a&b] |
| Apoptosis index (%) | 2 ± 0 | 52 ± 18[a] | 28 ±8[a&b] |
| Total cholesterol (mmol/L) | 1.66 ± 0.88 | 38.23 ± 13.82[a] | 33.48 ± 10.09[a] |
| Triglyceride (mmol/L) | 0.86 ± 0.33 | 1.31 ± 0.37[a] | 1.37± 0.34[a] |
| HDL (mmol/L) | 0.60 ± 0.25 | 1.78 ± 0.43[a] | 1.66 ± 0.42[a] |
| LDL (mmol/L) | 0.23 ± 0.03 | 47.25 ± 15.21[a] | 50.67 ± 15.32[a] |
| SOD (U/mL) | 197.57 ± 28.87 | 89.78 ± 23.73[a] | 195.22 ± 21.61[b] |
| MDA (nmol/mL) | 9.28 ± 3.33 | 17.29 ± 5.13[a] | 11.96 ± 3.39[b] |
| SMase (nmol/h/mg) | 0.27 ± 0.02 | 1.38 ± 0.35[a] | 0.32 ± 0.06[b] |
| Ceramide (pmol/nmol lipid phosphate) | 4.03 ± 0.73 | 10.01 ± 2.04[a] | 3.85 ± 0.91[b] |

Notes: [a&b] $p < 0.05$ (ANOVA).
[a] Group I vs Group II or III; [b] Group II vs Group III (with adjusted $p$ values).

decreased plasma total cholesterol (from 38.23 to 33.48 mmol/L), and HDL-C (1.78 vs 1.66 mmol/L). The plasma LDL level was slightly increased (from 47.25 to 50.67 mmol/L). However, co-treatment of the herbal formula slightly increased the plasma triglyceride level (1.31 vs 1.37 mmol/L).

Treatment of the atheromatous rabbits with the compound herbal formula consisting of leech, *Dahuang* and *Guipi* at 1.5 g/kg for 10 weeks significantly brought down the increased plasma MDA level to largely normal levels (Table 1). The compound herbal formula also significantly increased plasma SOD activity (from 89.78 to 195.22 U/mL). Moreover, the herbal formula inhibited aortal SMase activity (from 1.38 to 0.32 nmol/h/mg tissue) and decreased aortal ceramide level (from 10.01 to 3.85 pmol/nmol lipid phosphate).

## Discussion

The results demonstrated an anti-oxidative effect of the compound herbal formula, as indicated by increased SOD activity and reduced MDA levels. In the case of the hyperlipidaemia, the anti-oxidative capacity of the body decreases, excessive oxygen groups and free radicals are produced, and lipid oxidisation is promoted to produce a large amount of lipoperoxide and the degradation product, MDA.[3,33] The absence of suitable compensatory mechanisms from endogenous anti-oxidant systems causes a redox imbalance and leads to the activation of stress-sensitive intracellular signalling pathways. The increased production of reactive oxygen species can lead to damage of proteins, lipids, and DNA. LDL is the carrier of lipoperoxide which can be oxidisationally modified to form the ox-LDL.[3,33] Ox-LDL could induce the apoptosis of the vessel endothelial cells and affect the regeneration of these cells and the vessel endothelium-dependent relaxation. Ox-LDL is easily absorbed and phagocytised by the monocytes/macroghages which will be activated and release a number of mediators such as cytokines in the damaged intima, probably contributing to the pathogenesis of atherosclerosis.[2,3,8,33]

In the present study, we found that co-administration of the herbal formula reduced the apoptosis induced by a high-cholesterol diet in aortal plaque cells. The effects of leeches, *Dahuang* and *Guipi* and their active constituents on cell proliferation and apoptosis appear to be divergent. Some studies have shown that their components can induce apoptosis and inhibit the growth of a variety of tumour cell lines. For example, emodin isolated from *Dahuang* can induce multiple myeloma cell apoptosis through Janus-activated kinase 2 inhibition.[34,35]

As shown in Table 1, the development of diet-induced atherosclerosis was accompanied by an increased aortal SMase activity and ceramide, the second lipid messenger. The ceramide-mediated signal pathway is an important signal transduction system between the cell membrane and the nucleus.[36] Ceramide is formed from the sphingophospholipid in the membrane which was hydrolysed by the phospholipidase C. Ceramide can be degraded by ceramidases to sphingosine, and this, in turn, can be phosphorylated by sphingosine kinase to produce sphingosine-1-phosphate.[6] Both sphingosine and sphingosine-1-phosphate have been implicated in the regulation of cell proliferation and death.[6] Ceramide can activate a series of protein kinases and protein phosphatases of the 2 A family to initiate intracellular phosphorylation, induce the expression of a number of important proteins that regulate cellular apoptosis, senescence, proliferation or differentiation.[37] The ceramide signal pathway plays a key role in the development and the progression of atherosclerosis.[37] Decreased ceramide could contribute to the inhibition of apoptosis.

Treatment of the atheromatous rabbits with the compound herbal formula consisting of leech, *Dahuang* and *Guipi* at 1.5 g/kg for 10 weeks only slightly decreased total cholesterol and HDL levels and slightly increased LDL concentration. It appears that the herbal formula has a marked anti-oxidant effect in atheromatous rabbits, but its hypolipidaemic activity is minor to moderate.

Triglyceride is a higher risk factor than total cholesterol to arthrosclerosis-related coronary heart disease and stroke. However, the herbal treatment tended to increase serum triglyceride level from 1.31 to 1.37 mmol/L. The reason for this is unknown. The herbal formula may temporarily increase triglyceride synthesis and release from the liver when modifying fat acid metabolism.

In conclusion, the anti-oxidative capacity and inhibition of aortal cellular apoptosis and ceramide production by the compound herbal formula appear to be the major reason for the beneficial effects observed in this study. Further research is needed to explore the molecular mechanism underlying the beneficial effect of the compound herbal formula on atherosclerosis.

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# Treatment of a Grade Two Sprain of the Anterior Talofibular Ligament with Acupuncture and Moxibustion

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## ABSTRACT

This case report presents the treatment of a grade two sprain of the anterior talofibular ligament of a 24-year-old basketball player with acupuncture and moxibustion. Shallow needle technique and needle head moxibustion were applied at various intervals during treatment. However, the primary traditional Chinese medicine intervention was heat perception moxibustion. This method of moxibustion forms the foundation of the author's approach to acute injury management and involves the application of heat to injuries exhibiting significant signs of inflammation. No exacerbation of symptoms was noted when moxibustion was used in this case report. There were no reported incidences of re-injury during recovery and rehabilitation and return to participation were quick. Information pertaining to the incidence, nature and recovery periods associated with grade two ligament sprains, along with details of the different point selection methods used for acupuncture and moxibustion treatment, provide background for the case report. An example of the author's treatment of acute injury with moxibustion is presented in the case history. The discussion identifies a lack of information about moxibustion in the English literature and concludes that more effort is required in the areas of historical, clinical and scientific research if a comprehensive understanding of the mechanisms of action of moxibustion and the role they play in acute injury management is to emerge in an English-speaking context.

KEYWORDS acute injury, grade two sprain, heat perception, moxibustion, research.

## Introduction

Ankle sprains are one of the most common types of sporting injuries. The Australian Sports Commission estimates that an ankle sprain occurs in Australia once every 44 seconds.[1] All sprains are graded according to the severity of the injury involved. A grade two sprain of the anterior talofibular ligament (ATFL) is considered a moderate injury and involves partial tearing of the ligament, resulting in moderate pain and swelling. Patients usually have difficulty with weight bearing and range of movement (ROM) is restricted. A series of events, called the inflammatory response, follow a grade two ligament injury and produce redness, heat, swelling, pain and loss of function at the site of injury. These events are known as the five cardinal signs of inflammation and are not commonly treated with heat.

Conventional protocols for the rehabilitation of grade two sprains of the ATFL are well established.[2,3] Recovery takes four

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to eight weeks or longer,[4] with maximum benefit being gained after at least ten weeks of conventional rehabilitation.[5] The traditional Chinese medicine (TCM) treatment described in this case report continued for a total of six weeks and involved the use of acupuncture and moxibustion. Acupuncture treatment involved the use of shallow needle technique (SNT),[6] whilst moxibustion treatment involved the use of heat perception moxibustion (HPM)[6] and needle head moxibustion (NHM).[6] Both distal and local points were used during treatment. Distal points received acupuncture, whilst local points received a combination of acupuncture and moxibustion.

Distal point selection and angle of needle insertion were determined by palpation of the channels that traversed the injured area. Close attention was given to points that, when firmly pressed with the thumb, reduced the athlete's subjective sensation of pain in the ankle during rest and active range of movement (AROM). These points were then examined to determine if angle of palpation pressure further reduced the subjective sensation of pain in the ankle during rest and AROM. Points pressed 45% in the direction of the flow of Qi in the meridian proved most effective in this case report and were selected for treatment using SNT.

Local point selection was determined by visual and physical examination of the injured area, looking for evidence of one or more of the five signs of inflammation. Local points with significant evidence of inflammation were selected for treatment using HPM. NHM was not applied to the injured area until the signs of inflammation had almost completely disappeared.

## Case history

A 24-year-old male athlete presented in a clinic one morning with an injury to the anterior-lateral aspect of the left ankle. The injury had occurred the night before on a basketball court when landing awkwardly after attempting a short run-jump shot at the hoop. The ankle had inverted, rolling medially and slightly posteriorly, and a popping sound was heard on impact. Ice had been applied to the injury for an approximate total of three hours as the athlete waited to be seen by a doctor at his local accident and emergency department.

X-ray examination showed no damage to the bones of the lower leg and foot. The attending accident and emergency doctor diagnosed a grade two sprain of the ATFL. Analgesic and non-steroidal anti-inflammatory medication (ibuprofen) was prescribed for a period of one week, along with protection, rest, ice, compression, elevation and support (PRICES).

When the athlete arrived at the acupuncture clinic the morning after the injury, he walked with the assistance of crutches. When questioned, he reported limited weight-bearing capability. However, unassisted walking produced moderate to intense pain, rated by the athlete to be 8 out of 10 (where 1 = no pain and 10 = intense pain). The radial pulse was slightly rapid and wiry. His tongue and abdomen were unremarkable and his responses to standard TCM diagnostic questions[7] revealed no clinically significant information with respect to his presenting condition. Apart from his injury, he appeared to be in good physical condition and was keen to achieve a speedy recovery and return to participation.

A moderate amount of redness, heat and swelling was observed over the anterior-lateral surface of the ankle. Passive range of movement (PROM) of the injured ankle was observed to be limited when compared to PROM of the healthy ankle. The athlete reported that AROM, especially active dorsiflexion with external rotation of the injured ankle, produced moderate pain (7/10) in the anterior-lateral region of the ankle. The Anterior Talofibular Drawer Test produced a negative result for functional instability. Signs of inflammation and bruising with pain on palpation (4/10) were observed just inferior and posterior to the medial malleolus. There was no previous history of ankle injury or functional instability of the left ankle.

### TCM DIAGNOSIS

Local Qi and Blood stagnation of the Stomach, Gall Bladder and Kidney channels of the left lower leg due to trauma.

### BIOMEDICAL DIAGNOSIS

Grade two sprain of the anterior talofibular ligament.

### TCM TREATMENT PRINCIPLE

Relieve pain, resolve stagnation, reduce swelling, cool heat, to increase ROM, reduce recovery time and return the athlete to pre-injury level of participation using acupuncture and moxibustion.

### FIRST TREATMENT – 14 HOURS POST INJURY

Distal points chosen for the first visit were ST 36 *Zusanli*, ST 38 *Tiaokou*, GB 34 *Yanglingquan* and BL 58 *Feiyang*. Needles that were 30 mm in length and 0.18 mm in diameter were inserted into these points and retained for ten minutes whilst local points were located and treated. Needle insertion was reported to be painless. There was no attempt to solicit Deqi and no additional needle manipulation was performed.

Local points were chosen from areas of the foot that exhibited the most redness, heat, swelling and/or pain on movement. On the anterior-lateral surface of the ankle, GB 40 *Qiuxu* (located just above the anterior talofibular ligament), GB 41 *Zulinqi*, ST 41 *Jiexi*, and BL 62 *Shenmai* were selected for treatment. On the medial surface of the ankle, KI 6 *Zhaohai*, KI 3 *Taixi*, and KI 5

*Shuiquan* were selected for treatment. One round of HPM was applied to each point to reduce the signs of inflammation. The athlete was then advised to stop applying ice to the injury and to continue using crouches whenever moving about. Analgesic and non-steroidal anti-inflammatory medication continued as prescribed by the accident and emergency doctor.

### SECOND TREATMENT – ONE AND A HALF DAYS POST INJURY

The athlete returned to the clinic the following morning for a second consultation, during which time his progress was assessed and the HPM component of the first treatment repeated. As he had no history of peripheral neuropathy, blood pressure problems or mental abnormalities, the athlete was asked to observe the moxibustion procedure with the view of repeating the treatment at home. The athlete was equipped with detailed verbal and written instructions on the safe and effective use of moxibustion in the home environment and asked to burn one cone of prefabricated HPM on each point (as marked by a blue surgical marker), morning and night, for three days before returning to the clinic for an assessment of his progress.

### THIRD TREATMENT – FOUR AND A HALF DAYS POST INJURY

When the athlete returned to the clinic three days later, active dorsiflexion pain had reduced (5/10) and a significant reduction in local redness, heat and swelling was noted. Pressure pain at the medial-superior border of the calcaneal bone had also reduced (3/10). Distal points (ST 38 *Tiaokou*, GB 34 *Yanglingquan* and BL 58 *Feiyang*) were located via palpation and treated as described above. Local points were also chosen and treated as described above. As home treatment was proceeding smoothly, the athlete was asked to continue twice daily applications of moxibustion for another three days before returning to the clinic.

### FOURTH TREATMENT – SEVEN AND A HALF DAYS POST INJURY

By the fourth treatment the athlete had completed the recommended course of ibuprofen. Though he presented in clinic unaided by crotches he still walked with a slight limp. Redness, heat and swelling in the ankle had almost completely disappeared and dorsiflexion pain had reduced (2/10). Pain on palpation at the medial-superior border of the calcaneal bone was also minimal (1/10). However, some AROM restriction was noted when the toes were moved medially through a wide arch. Distal points equating to ST 38 *Tiaokou*, GB 34 *Yanglingquan* and BL 58 *Feiyang* were located and treated as described above.

As inflammation at the site of injury had almost completely disappeared, needle head moxibustion (NHM) was performed in preference to HPM. Only GB 40 *Qiuxu* was treated during the fourth treatment. A 30 mm × 0.18 mm needle was inserted into the point to a depth of half a cun and heated for 10 minutes with a prefabricated, smokeless form of NHM called *On Dan*™. This resulted in an immediate improvement in AROM post-treatment.

By the end of the fourth treatment the athlete was capable of walking without a limp. Therefore, he was advised to return to graded balance and weight training under the supervision of his strength and conditioning coach. NHM treatment of GB 40 *Qiuxu* continued, as described, for another five weeks at five- to seven-day internals. This was done to ensure adequate Qi and Blood circulation through the injured area to maintain ROM and to minimise the extent of scar tissue development at the site of the sprain. In addition, HPM was applied at home on an 'as needed' basis any time the athlete noticed post-exercise inflammation or fatigue in the ankle. No incidence of re-injury was reported during the acupuncture and moxibustion treatment period. One month post-injury the athlete reported that strength had returned to the ankle. After six weeks of acupuncture and moxibustion intervention the athlete reported that he was back playing basketball at pre-injury levels of participation.

## Discussion

This case report presents a complex treatment regime for the management of a grade two sprain of the ATFL including PRICES, anti-inflammatory and pain medication, acupuncture, moxibustion and professional conditioning training. As moxibustion forms the foundation of the author's approach to acute injury management, it will be the focus of the following discussion.

Scientific investigation into the mechanisms of action of moxibustion has taken place in East Asia since at least the early 1900s.[8] To date, very little of this research has been reported in the English literature and the mechanisms of action of moxibustion are poorly understood in this context. Understanding of the uses of moxibustion has evolved largely from historical research and the clinical observations and subsequent hypothesises of practitioners in the field, rather than scientific discourse.

Historical research reveals that the practice of moxibustion was divided into two categories, namely the scarring and non-scarring moxibustion traditions.[6] Both traditions are practised today and are commonly used to warm the meridians and expel cold, to induce the smooth flow of Qi and Blood, to strengthen Yang from collapse and to prevent diseases and maintain health.[9] Historical research also reveals that moxibustion can be used to guide excess heat and Yin deficiency heat to

exit the body.[10] Though some authors refute this use of moxibustion,[10] the following contemporary hypothesis – known as the 'Moxibustion Continuum' – attempts to explain how moxibustion causes heat to exit the body. This hypothesis states that:

> When the surface area [or base of a cone] of moxa is large, the heat will have little penetrative ability, so will go to the surface, activating the defensive ki [i.e. Qi] and, therefore, tonifying the yang ki. Since one of the main functions of yang ki is to radiate heat out of the body, putting heat into this level will cause the body to warm up and disperse heat outwards, often with localised sweating, which causes cooling and thus dispersion.[11]

The use of HPM in this case report was based on the hypothesis of the Moxibustion Continuum. Each cone was large, approximately 1 cm tall by 1 cm wide at the base, and was applied directly to the skin. Each cone burnt for about one minute and was removed the moment the athlete reported an itchy, hot sensation under the cone. HPM was developed by Keiri Inoue (1903–1967)[12] and belongs to the non-scarring moxibustion tradition. In East Asia it is believed to have anti-inflammatory effects[8] and is often used to disperse stagnant Qi.[13] As such, HPM can be applied to areas with pain and heat[13] to treat conditions such as arthritis, neuralgia and sprains.[12]

In the author's clinical experience, the application of HPM to injuries, such as sprains, almost always results in a reduction of the signs of inflammation, an amelioration of symptoms and a fast recovery and return to participation. However, as little moxibustion research has been reported in the English literature, it is not possible to conclude that HPM was the intervention responsible for the results noted in this case report. It could be argued, for example, that ibuprofen, and not HPM, was responsible for the reduction of symptoms. Indeed, it could be argued that ibuprofen actually prevented any exacerbation of symptoms that may have occurred when HPM was used in this case report.

Clearly, a more comprehensive understanding of moxibustion is needed. For this to occur, continued efforts are required in the areas of historical and clinical research as well as case reports. However, the author concludes that until significant efforts are directed towards understanding the science of moxibustion, its mechanisms and the role they play in acute injury management are likely to remain a mystery in the English-speaking context.

## Conclusion

This case report presented the treatment of a grade two sprain of the ATFL. A complex treatment regime was described including conventional and TCM interventions. TCM intervention involved acupuncture and two types of moxibustion. Of the two types of moxibustion described, HPM was utilised during the inflammatory phase of recovery. NHM was only applied once the signs of inflammation had significantly reduced. In the case history the author presented a treatment in which moxibustion was applied directly over the inflammation of acute injury. No incidence of re-injury occurred during recovery, whilst rehabilitation and return to participation were quick. The discussion noted a long history of scientific investigation into the mechanisms of action of moxibustion in East Asia, and reported a paucity of information about moxibustion in the English literature. In conclusion, for a more comprehensive understanding of the mechanisms of action of moxibustion and the role they play in acute injury management to emerge in the English literature, more historical, clinical and scientific enquiry is required.

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## Clinical Commentary

The case report will be of particular interest to TCM practitioners seeking a simple yet effective way to manage the redness, heat, swelling, pain and loss of function associated with acute injury. Readers are presented with an example of the treatment of a common sports injury with moxibustion. Recovery and return to participation were quick and the athlete did not report any incidence of re-injury during the treatment period. Practitioners familiar with the heat perception moxibustion method can expect to achieve similar treatment outcomes to those presented in this case report. As the use of moxibustion in the management of acute injury has not been widely discussed in the English literature, this case report also identifies an exciting avenue of research for interested parties.

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# Current Research and Clinical Applications

## Chinese Herbal Medicines for Toxicity Reduction in Cancer Chemotherapy

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Cancer is a leading killer of Australians. Chemotherapy is a major modality for the treatment of cancer, but it often fails due to dose-limiting toxicities and tumour resistance. Cytotoxic therapeutic agents kill not only cancer cells but normal cells, inducing host organ injuries and causing severe blood and gastrointestinal toxicities. For example, administration of irinotecan, 5-fluouracil, oxaliplatin, capecitabine, and raltitrexed are associated with diarrhoea in 50–80% of patients in randomised phase III trials.[1] The incidence of grade 3 or 4 diarrhoea was up to 40% of patients with use of irinotecan.[2] Such toxicities limit the further evaluation of more aggressive regimens and significantly decrease the quality of life of patients. In clinical practice, a number of standard supportive therapies such as growth factors and symptom-alleviating therapies (e.g. analgesics and anti-diarrhoea agents) are available in cancer chemotherapy to protect the bone marrow and gastrointestinal tracts and alleviate organ-toxicity associated symptoms. However, several studies have found that a substantial number of cancer patients also use Chinese herbal medicines (CHM) in combination with anticancer drugs in an attempt to reduce drug toxicities and to consolidate the immune system.[3]

A recent double-blind, placebo-controlled and randomised clinical trial was conducted by Mok et al.[4] to investigate the efficacy of toxicity reduction of CHM in 120 patients with early-stage resected breast or colon cancer. These patients were treated with adjuvant chemotherapy in combination with a herbal formula consisting of multiple CHMs for 14 days or with a placebo. The adjuvant chemotherapy for patients with breast cancer consisted of adriamycin 60 mg/m$^2$ and cyclophosphamide 600 mg/m$^2$ given three-weekly for four cycles. All patients received intravenous granisetron 3 mg and dexamethasone 10 mg as prophylactic antiemetic therapy. The patients with colon cancer were treated with 5-fluorouracil 425 mg/m$^2$ and folinic acid 20 mg/m$^2$ given once daily on days 1–5 of a 28-day cycle for six cycles. The colon cancer patients did not routinely receive prophylactic antiemetic therapy, but metoclopramide and dexamethasone were given if they experienced nausea or vomiting. According to the patient's condition, the well-trained herbalist prescribed a combination of single-itemised herbs from the stock of commonly used herbs and the patients were randomised to receive either the prescribed herbal combination or placebo for 14 days. Two hundred and twenty-five types of the commonly used herbs were stocked in packaged form (see Box 1). All these herbs are listed in the China Pharmacopoeia.[5] Each package contained 3–10 g of water-soluble herbal granules that were manufactured at a Good Manufacture Practice standard facility. To prepare the herbal granules, each herb was boiled in hot water according to the traditional method of herbal tea preparation. The raw materials for the placebo included Chinese Puer tea (*Camellia sinensis var. assamica*), black bean paste (*Dandouchi*, *Semen Sojae praeparatum*), malt sugar (*Maiya*, *Fructus Hordei vulgaris germinatus*), food colour, and artificial flavour. The primary end points were haematologic and non-haematologic toxic effects according to the National Cancer Institute Common Toxicity Criteria (version 2).[6] Secondary end points included quality of life during therapy, treatment compliance, dose intensity, and tumour recurrence rate.

The incidence of grade 3/4 anaemia, leucopoenia, neutropoenia, and thrombocytopoenia in patients treated with CHM for 14 days is not significantly different from that in patients receiving placebo only (5.4%, 47.3%, 52.7% and 1.8% vs 1.8%, 32.2%, 44.7%, and 3.6%, respectively). However, the incidence of nausea is significantly decreased in the CHM-treated group compared to the control group (14.6% vs 35.7%). There were no significant differences in other non-haematologic toxicities between the CHM and placebo groups. The change in the score for each domain in the European Organisation for Research and Treatment of Cancer (EORTC) QLQC30 between each cycle of chemotherapy and baseline was compared and there was no significant difference between the CHM and placebo groups.

## CLINICAL RELEVANCE

The findings from the above study indicate that CHM does not alleviate chemotherapy-induced haematological toxicity, but significantly reduces cytotoxic drug-induced nausea. The results are encouraging and suggest that CHM may play a role in the management of chemotherapy-induced toxicities. However, the current study has several intrinsic limitations, which compromise its scientific significance. For example, the authors did not conduct well-designed stratification analysis and the placebo used in this study contains medicinal tea (i.e. *Camellia sinensis*), so the conclusion appears unconvincing. A stratification analysis will check for the effects of other potential covariables such as age, gender, performance status, and tumour type and chemotherapy regimen on toxicity profiles. In particular, the choice of a placebo containing medicinal herbal components is unacceptable. In addition, the herbal treatment regimen was 14 days starting from day 1, which was not optimised. The study did not measure any biomarkers indicating the active components in the herbal formula probably responsible for its efficacy.

A potential pharmacokinetic response of anticancer drugs to herbal medicines should also be taken into account when CHM is used in combination with cytotoxic drugs. This occurs because herbal medicines alter the absorption, metabolism and disposition of chemotherapeutic drugs.[7,8] For example, St John's wort (*Hypericum perforatum*) has been found to reduce by 42% the plasma levels of SN-38, a cytotoxic metabolite of irinotecan used in the treatment of advanced colon cancer.[9] Two recent studies indicate that St John's wort treatment also significantly reduced the area under the plasma concentration time curve of imatinib (a potent inhibitor of the Bcr-Abl and c-kit tyrosine kinases) in healthy subjects.[10,11] In addition, garlic (*Allium sativum*) consumption decreases the systemic clearance of docetaxel in cancer patients harbouring a cytochrome P450 3A5 (*CYP3A5*1A*) allele.[12] Therefore, caution must be taken when herbal medicines are used with an attempt to ameliorate the toxicities of cancer chemotherapy.

## CONCLUSION

Many cancer patients receive Chinese herbal medicines despite the lack of evidence supporting their potential beneficial effects. This certainly highlights the necessity of testing the efficacy and safety of Chinese herbal medicines aimed at reducing the host toxicities of chemotherapy.

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**BOX 1** Two hundred and twenty-five commonly used herbs utilised in the study by Mok et al.[4]

*Radix Scrophulariae (Xuanshen); Polyporus (Zhuling); Coix lacrymajobi (Yiyiren); Semen Plantaginis (Cheqianzi); Herba Lysimachiae (Jinqiancao); Spora Lygodii (Haijinsha); Herba Artemisiae scopariae (Yinchenhao); Fructus Kochiae (Difuzi); Herba Dianthi (Qumai); Herba Plantaginis (Cheqiancao); Pericarpium Arecae (Dafupi); Rhizoma Smilacis glabrae (Tufuling); processed Radix Aconiti (Caowu); Rhizoma Zingiberis (Ganjiang); Cinnamomum cassia; Herba Asari (Xixin); Fructus Evodiae (Wuzhuyu); Radix Aconiti kusnezoffii (Caowu); Citrus reticulata; Fructus Auranti immaturus; Citrus medica; Cyperus rotundus (Xiangfu); Radix Linderae strychnifoliae (Wuyao); Fructus Meliae toosendan (Chuanlianzi); Caulis Perillae (Sugeng); Massa medicata fermentata (Shenqu); Fructus Hordei germinatus (Maiya); Fructus Crataegi (Shanzha); Semen Raphani (Laifuzi); Herba seu Radix Cirsii japonici (Daji); Herba Cephalanoploris (Xiaoji); Radix Sanguisorbae (Diyu); Sophora japonica; Thuja orientalis; Herba Agrimoniae (Xiahecao); Rhizoma Bletillae (Baiji); Pollen Typhae (Puhuang); Radix Notoginseng (Sanqi); Rhizoma Ligustici (Chuanxiong); Olibanum (Ruxiang); Myrrha (Moyao); Rhizoma Corydelis (Yanhusuo); Radix Curcumae (Yulin); Rhizoma Curcumae (Ezhu); Rhizoma Sparganii (Sanleng); Radix Salviae miltiorrhizae (Danshen); Herba Leonuri (Yimucao); Semen Persicae (Taoren); Flos Carthami (Honghua); Faeces Trogopteri (Wulingzhi); Achyranthes bidentata (Huainiuxi); Cyathula officinalis (Chuanniuxi); Squama Manitis (Chuanshanjia); Lignum Dalbergiae odoriferae (Jiangxiang); Fructus Liquidambaris (Lulutong); processed Rhizoma Pinelliae; Rhizoma Pinelliae (Banxia); Rhizoma Arisaematis (Tiannanxing); Rhizoma Typhonii (Baifuzi); Radix Aconiti coreani; Radix Platycodi (Jiegeng); Flos Inulae (Xuanfuhua); Bulbus Fritillariae thunbergii (Zhebeimu); Rhizoma Cynanchi stauntonii (Baiqian); Fructus Trichosanthis (Gualou); Bulbus Fritillariae cirrhosae (Chuanbeimu); Caulis Bambusae in taeniis (Zhuru); Bitter Apricot Kernel (Kuxingren); Sargassum fusiforme; Radix Stemonae (Baebu); Loquat leaf (Pipaye); Radix Scutellariae (Huanqin); Cortex Mori albae radicis (Sangbaipi); Semen Lepidii (Tinglizi); Stir-baked Flos Tussilaginis farfarae (Kuandonghua); Radix Peucedani (Qianhu); Ferrosoferric Oxide; Os Draconis (Longgu); Semen Ziziphi spinosae (Suanzaoren); Semen Biotae (Baiziren); Radix Polygalae (Yuanzhi); Cortex Albizziae Hehuanpi); Radix Codonopsitis (Dangshen); Radix Pseudostellariae (Taizishen); Radix Astragali (Huangqi); Rhizoma Atractylodis macrocephalae (Baizhu); Rhizoma Dioscoreae (Bixie); Glycyrrhiza uralensis; Radix Panacis quinquefolii (Xiyangshen); Ziziphus jujuba (Dazao); Radix Morindae officinalis (Bajitian); Herba Cistanches (Roucongrong); Rhizoma Curculiginis (Xianmao); Herba Epimedii (Yinyanghuo); Cortex Eucommiae (Duzhong); Radix Dipsaci (Xuduan); Rhizoma Cibotii (Gouji); Rhizoma Drynariae (Gusuibu); Fructus Psoraleae (Buguzhi); Fructus Alpiniae oxyphyllae (Yizhiren); Cuscuta japonica; Herba Cynomorii (Suoyang); Radix Angelicae sinensis (Danggui); Rehmannia glutinosa; Radix Polygoni multiflori (Heshouwu); Radix Paeoniae albae; Radix Ophiopogonis (Maimendong); Herba Dendrobii (Shihu); Bulbus Lilii (Baihe); Fructus Lycii (Gouqizi); Herba Ecliptae (Hanliancao); Ligustrum lucidum; Radix Glehniae (Shashen); Fructus Schisandrae (Wuweizi); Fructus Tritici aestivi levis (Fuxiaomai); Radix Oryzae glutinosae; Radix Ephedrae (Mahuanggen); Fructus Corni (Shanzhuyu); Fructus Rosae laevigatae (Jinyingzi); Fructus Rubi (Fupenzi); Concha Arcae (Wanglengzi); Folium Ginseng; Radix Adenophorae (Nanshashen).*

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# Herbal Medicine for Depression

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Depression is one of the most common disorders for which treatment is sought through complementary therapies, including acupuncture and herbal medicine.[1,2] There are three very common types of depressive disorders: major depression (unipolar depression), dysthymia (a less severe depression), and bipolar disorder (manic-depressive illness).[3] Depression affects about 121 million people worldwide.[4] In any given one-year period, 9.5% of the population in the United States of America suffer from depression.[3] Depression falls into the category of *Yu* syndrome in traditional Chinese medicine (TCM) and its treatment depends on pattern differentiation. Liver Qi stagnation is one of the common patterns for depression. Herbal formulas containing *Chaihu* (*Radix Burpleuri*), which are also called *Chaihu Ji*, are often used for depression treatment. Recent research has examined the clinical effectiveness and biological mechanism of *Chaihu Ji* in the treatment of depression.

## CLINICAL STUDY WITH *XIAO YAO SAN*

Zhang et al.[5] investigated the effect of *Jia Wei Xiao Yao San* (JWXY) as monotherapy in depressed patients. A total of 87 unipolar and 62 bipolar depressed patients were randomly assigned to treatment with 36 g/day JWXY ($n$ = 86) or placebo ($n$ = 63) for 12 weeks under double-blind conditions. Both unipolar and bipolar patients assigned to JWXY displayed significantly greater improvement on the three efficacy indices, i.e. the Hamilton Rating Scale for Depression, Montgomery-Asberg Depression Rating Scale, and Clinical Global Impression-Severity, and a significantly higher clinical response rate (74%) than those treated with placebo (42%, $p < 0.001$) at end point of 12 weeks.

In addition, this study also examined the effect of JWXY as adjunctive therapy with carbamazepine (CBZ) for bipolar disorders by using a double-blind, randomised, placebo-controlled method. Bipolar patients ($n$ = 188) were treated by CBZ plus placebo ($n$ = 92) or CBZ plus JWXY ($n$ = 96) for 26 weeks. Patients taking adjunctive herbs showed a significantly lower overall discontinuation rate (31%) at end point compared to placebo (51%). Patients receiving adjunctive herbs had significantly fewer adverse side effects, such as dizziness and fatigue, and lower serum levels of CBZ than those in placebo. The combination of JWXY with CBZ resulted in significantly better outcomes on depressive measures at week 4 and week 8, but not in the later stage (from week 12 to week 26). The combination treatment failed to produce significantly greater improvement on manic measures. These results suggest that adjunctive JWXY improves tolerability of CBZ in long-term use. JWXY monotherapy may also be an effective alternative treatment for depressed conditions.

Chen et al.[6] studied the effects of *Xiao Yao San* in patients with the pattern of Liver-Qi stagnation and Spleen deficiency.

Fifty-eight cases were randomly divided into two groups: 41 cases in the experimental group were treated with *Xiao Yao San* and 17 cases in the control group were treated with *Zhi Bai Di Huang Wan* for one consecutive month in a single blind design. Before and after treatment, the changes of plasma norepinephrine (NE), epinephrine (E), dopamine (DA), β-endorphin (β-EP), adrenocorticotropin hormone (ACTH), estradiol (E2), testosterone (T), and immunoglobulin A (Ig A) and G (Ig G) were measured. These indices were used to determine the effect of herbs on neuron-endocrine and immune markers. Compared to baseline levels, plasma β-EP was significantly increased at one month, while E and DA were markedly decreased after the administration of *Xiao Yao San*. No effect was found on other study end points. These results suggest *Xiao Yao San* may work through enhancing plasma β-EP and decreasing E and DA release. *Xiao Yao San* may regulate nervous and endocrine systems and contributes to the improvement of the clinical status of patients with Liver stagnation and Spleen deficiency.

## *CHAIHU GUIZHI GANJIANG TANG* IMPROVING DEPRESSED MOOD

Ushiroyama et al.[7] examined the effects of *Chaihu Guizhi Ganjiang Tang* (CGG) in 90 depressed peri- and post-menopausal women. The effect of CGG was examined in relation to improving depressed mood, and stress moderators cytokines interleukin-6 (IL-6), and interleukin-6 receptor (sIL-6R) concentrations. Subjects were separated into two groups (herb group 42 cases and anti-depressants group 48 cases). Plasma IL-6 and sIL-6R concentrations were determined before and after three months of the treatment. There were no significant reductions in both climacteric and Hamilton depression score after treatment between groups. Plasma IL-6 and sIL-6R concentrations were significantly lower in the herbal group (–34.8 ± 15.5% and –22.4 ± 14.6%, respectively) compared to the anti-depressant group (7.5 ± 4.8% and 2.4 ± 3.8%, respectively) after three months of treatment. CGG reduced plasma IL-6 and sIL-6R concentrations in relation to improvement of depressed mood during treatment. These findings suggest that CGG has the potential to decrease morbidity by alleviation of stress reactions in peri- and post-menopausal women.

## LABORATORY STUDY WITH *CHAIHU JIA LONGGU MULI TANG*

Mizoguchi et al.[8] studied the effect of *Chaihu Jia Longgu Muli Tang* (CLM) on the chronic stress-induced changes in glucocorticoid receptors in the prefrontal cortex (PFC) and hippocampus, and disruption of the hypothalamo–pituitary–adrenal (HPA) axis. A reduction in glucocorticoid receptor (GR) function and dysfunction of the glucocorticoid negative feedback system were observed in human depressives. Previously, Mizoguchi et al. reported that chronic stress in rats induced a decrease of cytosolic GRs or increased nuclear GRs[9] and CLM prevented the chronic stress-induced HPA disruption.[10] In this study, chronic stress was induced in rats by water immersion and restraint (2 h/day) for four weeks. CLM significantly prevented decreased cytosolic GRs in the PFC and increased nuclear GRs in the hippocampus. Moreover, CLM significantly prevented the abolishment of feedback ability in both regions. These results suggest that the beneficial effects of CLM on the GR level are involved in its ameliorating actions on the HPA disruption. This finding provides information important for the prevention and treatment of depression.

Zhu et al.[11] investigated the antidepressant-like effect of saponins extracted from CLM in mice and rats using the tail suspension test (TST) and the forced swimming test (FST). Subchronic administration of 100 and 200 mg/kg (p.o.) of the extract for seven days reduced immobility time in the TST and FST in mice and also decreased immobility time at 70 and 140 mg/kg (p.o.) in the FST in rats. The results also showed that the anti-immobility activity of SCLM in these two tests is dose-dependent, without accompanying significant effects on locomotor activity. Experiments using PC12 cells suggest that the antidepressant-like effect of CLM might be mediated via the cytoprotective action.

## CLINICAL RELEVANCE

The above studies from clinical trials, animal models, and laboratory examinations suggest that *Chaihu*-containing formulas (*Chaihu Ji*) may be effective in the treatment of depression. While *Chaihu Ji* includes several formulas with different herbal components, each formula is used for different patterns. Depression may be treated by different principles with different formulas. For the clinical application of *Chaihu Ji* in the treatment of depression, it is still necessary to apply treatment based on pattern differentiation.

## CONCLUSION

The role of herbal medicine in the treatment of various psychological disorders including depression has become well established over the past decade.[1] Recent studies support the fact that herbal medicine may be an effective choice for the treatment of depression. The interaction of herbal medicine and conventional antidepressants is an important issue to be studied, although some research has been done in this field.[1,12,13]

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# Standardisation: A Prerequisite for Evidence-based Traditional Medicine Development and Internationalisation

## A Report on the WHO International Standard Terminologies on Traditional Medicine in the Western Pacific Region

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### BACKGROUND

The history of medicine reveals surprisingly similar processes in the development of traditional medicine in the West over the last two to three decades and that of modern medicine in Asian countries approximately one and a half centuries ago. When modern medicine was initially introduced into countries such as China in the mid-eighteenth century, the acceptance of this new and foreign form of medicine was low and, for a substantial period of time, modern medicine was not considered the mainstay of health care. However, 150 years later, although traditional medicine continues to play a central role in health service delivery, western medicine has developed into the main form of health care. Many factors have contributed to the rapid development of modern medicine, including the standardisation of terminologies and diseases classification as well as the recent development of clinical guidelines that facilitate effective communication and health informatics.

Despite various forms of traditional medicine having long histories of clinical practice and making significant contributions to affordable and equitable health care in the countries of their origin, communication between healthcare professionals concerning traditional medicine has proven difficult. This has become more apparent over the last three decades when various forms of traditional health care became increasingly popular in the western world and the consumer-driven development of traditional medicine in such developed countries generated significant interest amongst academics, governments and regulators.

To address the challenge of communication difficulties amongst stakeholders, the World Health Organization (WHO) has developed strategies to promote evidence-based development and internationalisation of traditional medicine. However, it is recognised that these will be difficult to implement without standardisation of the terminologies of traditional medicine. In addition, the diversity of traditional medicine has made such a task extremely difficult. Thus, the WHO's Western Pacific Regional Office initiated a process to develop standard terminologies for the main forms of traditional medicine in its region with a common origin, that is, traditional Chinese medicine. The successful implementation of this initiative will provide invaluable experience for the future development of common terminologies for other forms of traditional medicine in the Western Pacific and in other WHO regions.

### THE PROCESS OF THE DEVELOPMENT OF WHO INTERNATIONAL STANDARD TERMINOLOGIES (IST) FOR TRADITIONAL MEDICINE IN THE WESTERN PACIFIC REGION

Under the 'standardisation with evidence-based approaches' set by the WHO's Western Pacific Regional Office, a series of activities have been carried out, such as international disease classification, development of clinical guidelines and standardisation of acupuncture point locations and nomenclatures. However, the first step to achieve these outcomes was to develop international standard terminologies of traditional medicine

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with a specific focus on the most significant forms of traditional medicine in the region.

A systematic approach was taken to ensure that relevant countries/regions were willing to participate, that the standardised terms were acceptable in these countries/regions and that they were also appropriate and acceptable in the English-speaking world.

Over a period of three years (2004–2007), three expert consultations involving a large number of experts were held in China, Japan and the Republic of Korea. The first meeting was held to seek support from the three key member states, China, Japan and the Republic of Korea, and to identify the key resources available. A second meeting was then held to determine the process of selecting terms and to discuss the general principles of English translation and the overall structure of the terminologies. The final meeting involved experts from eight countries, including Australia, to determine the English translation and to further confirm the selection of the terms for inclusion and to refine the structure of the terminology.

In addition to the above meetings, two stages of consultation with international experts were undertaken to obtain broader input from a number of experts from English-speaking countries and thereby to ensure the accuracy and readability of the terminologies so that they could be implemented effectively. Such experts included representatives of traditional medicine education institutions, researchers, practitioners and health regulators.

## THE IST

The final version of the IST, which consists of eight chapters of the key terminologies, was published in August 2007. It is available on WHO's Western Pacific Regional Office website: www.wpro.who.int/publications/PUB_9789290612487.htm

The eight chapters of the IST, with over 4000 terms, cover all major areas of the theory and practice of traditional medicine in the Western Pacific Region, namely, general terms, basic theories, diagnostics, diseases, therapeutics, acupuncture and moxibustion, medicinal treatment and classical texts.

The deliberation of the English translations was guided by a number of agreed principles, including a decision that no new English terms would be created, while the selected English terms should also accurately reflect the meaning of the original Chinese words. When more than one translation was suggested for one Chinese term, voting was introduced to facilitate the final decision making. If two English words were equally supported, then both were listed as alternatives, such as meridians/channels, and syndrome/pattern.

These terms are not meant to be exhaustive; instead, the IST represents a first attempt. Nevertheless, for some states, although addenda may be required to make it more relevant to everyday practice, the IST may be more than adequate. It is WHO's view that ongoing improvement will be required. However, timely implementation of the IST is also needed in order to test the practicality and user friendliness of this set of terminologies. The ultimate goal is to evaluate how these IST terms have improved communication of traditional medicine and health informatics by all relevant users throughout the world.

## COMMENTS

Much has been learnt from the process of developing the IST over the three-year period. Firstly, the long-term practice of traditional medicine in the Western Pacific Region provides the necessary literature and expertise as the base for such development. The willingness and co-operation from the three key member states (China, Japan and Republic of Korea) has been exemplary for future international development in traditional medicine. Secondly, the rapid development of traditional medicine in the developed world has provided abundant literature in English for the selection of sources of translation and expertise to determine the appropriateness of translations. The collaboration between experts from traditional medicine–originating countries and those in the English-speaking countries has been outstanding. Thirdly, the resources provided by the Ministry of Health, Republic of Korea, have been a critical contribution to enabling such an endeavour, while other support has been provided by China and Japan. Furthermore, the invaluable contributions from experts worldwide for the development, revision and commentary of the draft IST have made this development truly international. Lastly but most importantly, the leadership provided by the WHO's Western Pacific Regional Office has been instrumental to such an initiative in following through in a most efficient and effective manner.

The IST has led to the development of an international classification of traditional medicine in the Western Pacific Region and has been proposed for inclusion in WHO's Family of International Classification of Diseases. The effective implementation of the IST, and hopefully the international classification of traditional medicine within the Western Pacific Region in the near future, will definitely contribute to the internationalisation and evidence-based development of traditional medicine both in the region and globally.

# Forum for the Development of an International Standard of Sterile Acupuncture Needles for Single Use

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From 12 to 13 June 2007, a 'Forum for the Development of an International Standard of Sterile Acupuncture Needles for Single Use' was held in Daejeon, South Korea. Hosted by the Korean Institute of Oriental Medicine (KIOM), twelve participants from five countries (China, Korea, Japan, Vietnam and Australia) met to discuss the possibility of establishing an International Standard (ISO) for disposable acupuncture needles.

The welcoming speech was given by Dr Seung-Hoon Choi (Regional Adviser in Traditional Medicine for the World Health Organization, Western Pacific Regional Office), who outlined the current WHO projects associated with standardisation (e.g. acupoint location, Chinese medicine terminology). Following the opening assembly, Dr Tan Yuansheng (Director of the Standardisation Committee of the World Federation of Acupuncture–Moxibustion Societies, WFAS) presented on the status of a number of standardisation projects WFAS was undertaking or had completed, including the China needle standard (*Guobiao* (GB) the Chinese National Standards). This was followed by the Japanese representatives, Professor Hitoshi Yamashita of Morinomiya University of Medical Sciences and Professor Katai of Tsukuba University of Technology, who relayed their experiences of sitting on a committee for the development of a Japanese Industrial Standard (JIS) for needles. The diversity of Japanese needle manufacturers, from small family businesses to the large manufacturing companies, and the need for inclusiveness, were some of the difficulties they encountered when developing the Japanese standard. Dr Chris Zaslawski (University of Technology, Sydney) then presented some previous research on needle usage in the Sydney region, highlighting the rapid increase in disposable needle usage in the mid 1980s following the public awareness campaign associated with HIV and AIDS. Dr Nguyen Thi Van Anh (National Hospital of Traditional Medicine, Vietnam) outlined the current status of needle usage in Vietnam and the scope of needle manufacture in her home country. Dr Sung-Tae Koo (KIOM) then presented a draft document that had been previously circulated as a basis for discussion and gave a brief summary of the process required for the development of an ISO.

The second day commenced with a presentation on the specific metallurgic requirements for the acupuncture needle and issues of biocompatibility. This was given by Professor Minho Lee from Chunbuk National University, who worked in the Dentistry school and had extensive research experience in the area. Following was an interesting review of the research on the microstructure of the tip of acupuncture needles by Professor Jang Insoo from Woosuk University, Korea. His presentation consisted of various electron microscope slides showing needle-tip anomalies and defects. The afternoon session involved working through a draft document, noting areas of consensus and disagreement among participants. Areas of discussion included needle component terminology, quality measures, packaging and labelling.

At the completion of the forum, the participants thanked Dr Sun-Mi Choi (Director, KIOM) and Dr Sung-Tae Koo (Senior researcher, KIOM) for co-ordinating the event and Professor Kang Sung-Keel (Kyunghee University) for acting as chair. An outcome statement was agreed upon and future plans for initiating and developing an ISO were devised (listed below).

## FORUM OUTCOME STATEMENT

- Discussion occurred concerning the procedure of developing an international standard (ISO) of sterile acupuncture needles for single use.
- There was general agreement regarding the need for an international standard (ISO) of sterile acupuncture needles for single use.
- A draft document of the international standard of sterile acupuncture needles for single use was reviewed and revised.
- Discussion should be maintained regarding an international standard (ISO) of sterile acupuncture needles for single use.
- Participants agreed to return to their country with the draft document and consult with relevant authorities.

## FUTURE PLAN

- Participants should consult with relevant standards organisations in their countries.
- For the next meeting, future funding should be sought from various sources. It is suggested that the next meeting will be held in April or May 2008.
- The aims and objectives of the next meeting should be circulated and reviewed by each participating country prior to the meeting.

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# Book Reviews

## Electroacupuncture: A Practical Manual and Resource

David F Mayor (editor)
Elsevier Churchill Livingstone, 2007
ISBN 0443063699
381 pages

The recent publication of the long-awaited David Mayor book – *Electroacupuncture: A Practical Manual and Resource* – was well worth the wait. Given the widespread use of electro-stimulation, there was a definite need for such a book. Published by Elsevier Churchill Livingstone, this 381-page hardcover text, as well as being a practical clinical manual and giving the basics, is also, as the title suggests, a valuable research resource for those who want to know more.

The text has three sections. Section one outlines the historical context (both East and West) of the development of electrotherapy and electroacupuncture. A table showing the important historical milestones of electrotherapy, electroacupuncture (EA) and manual acupuncture allows the reader to contextualise and compare their interaction and development over time.

Section two, the bulk of the book, details the scientific and clinical foundations of EA. The basic theory of electromagnetism and electrotherapy are discussed as are the neuroscience mechanisms that underlie the effects of EA. An interesting chapter, 'Does electroacupuncture work? Evaluating the controlled trials' by Adrian White reviews the current evidence based on 400 references to trials of EA. Following this chapter occurs an extensive review of the effects of EA on various body systems, with international contributors adding to each area. Clinical areas reviewed include stroke and cerebrovascular disease, obstetrics and gynaecology, post-operative pain and addiction, amongst others.

Section three is the practical section of the book and begins with a chapter that deals with the available technology, including TENS and electro-diagnostic devices and their use. The following chapter explains the factors that need to be considered when purchasing a machine. Issues such as waveforms, pulse duration, size and design are discussed, and there is a review of the most common machines on the market. This section concludes with a review of the do's and don'ts of using electroacupuncture, magnets and TENS as well as a summary of how the technology can be practically integrated into clinical practice.

At the end of each chapter is a summary, an identification of additional information found on the companion CD and a list of recommended readings. The text has ample line drawings as well as case-study text boxes which add to the clinical utility of the book. My only criticism has to do with formatting and the small font and line spacing. Compared to other Chinese medicine texts published by Churchill Livingstone, I found this book difficult to read, especially late at night! Given the breadth of information and scope of the book, the need to physically condense the text is understandable. Mayor, as he says in his preface, wanted it to be a resource, and in his quest to achieve that he has obviously reviewed and included a huge amount of published material. This is evident when looking at the companion CD, which has over 8000 references in its database! There are also two appendices, one listing websites, organisations and suppliers of the equipment (no Australian suppliers, unfortunately), while the second appendix looks at some of the issues of practising in a regulated environment, such as the European Union. Finally, Mayor has included a very helpful glossary defining many medical and technical terms. This book sets the standard and will be a valuable asset for any practitioner who uses or will want to incorporate electroacupuncture into daily practice.

***Christopher Zaslawski***

# Shen: Psycho-emotional Aspects of Chinese Medicine

Elisa Rossi
Churchill Livingstone Elsevier, 2007
ISBN 0443101817
452 pages

Shen is a complicated yet important Chinese medicine concept. Experienced acupuncturists always consider Shen in their practice. The ancient text *Neijing Lingshu* states that 'when needling, one must focus on Shen'. A famous acupuncturist, Zhou De An, says 'the foremost important principle when treating pain conditions is to calm the Shen'. There is, however, little English literature discussing Shen, despite its clinical significance. *Dragon Rises, Red Birds Fly: Psychology and Chinese Medicine* by Leon Hammer is the earliest book in this area.

*Shen*, a 452-page book, is the second book of this kind. The book was initially published in Italian in 2002. Its English edition is published in 2007. The author Dr Elisa Rossi is an acupuncturist and psychotherapist practising in Milan, Italy.

*Shen* has four sections. In the first section, Dr Rossi introduces the Daoist concept of health and life preservation (*Yang Sheng*). She also explains how five emotions and five types of Shen impact the movement of Qi and cause or worsen illnesses. In the second section, clinical conditions, such as restlessness and insomnia, are analysed with Chinese medicine theories, and their management is explained. The third section details the therapeutic approaches to treating Shen in different syndromes, such as Heart Fire or Obstruction by Phlegm-Tan. Other important aspects of the treatment of Shen, including needling techniques and patient–practitioner interaction, are also discussed. The last section consists of writings from seven experts presenting their own clinical experiences of treating psychological conditions.

Before reading the book, I had four questions in my mind. (1) Will the author discuss Shen with a focus on psychological conditions, or expand the concept of Shen in commonly seen conditions? (2) Will clinical cases be used to further illustrate the views? (3) Will the author discuss cultural differences in the understanding and expression of emotion? (4) Will the author present her integrated understanding of psychotherapy and Chinese medicine?

Using ample classic literature and many clinical cases, Rossi shows the readers that disturbance of Shen exists not only in patients who complain of insomnia or palpitation (typical symptoms of Shen disorders), but also in most common complaints, such as bodily pain. Successful treatment of Shen might lead to a complete resolution of pain. This answers my first and second questions.

The cultural difference in the expression of emotion is an issue for Chinese medicine practitioners with Asian backgrounds. Rossi mentions that Chinese medicine sees emotion as an integral part of health, but Chinese people seldom express their emotion compared to Europeans. This topic is, however, not expanded to the extent I would like to see.

My fourth question is partially answered in Chapters 15 and 16 of the book. These two chapters are particularly relevant to all acupuncturists. Rossi shares her insights with real-life questions. She asks us to examine ourselves when a patient who once liked us becomes hostile. Using her own cases, she illustrates when the boundary of a patient–therapist relationship is crossed and what the practitioner should do. Her knowledge of psychotherapy frequently appears in these chapters and gives the readers a better appreciation of our clinical practice.

This book is comprehensive, and can be used as a textbook or resource book on Shen and Chinese medicine. It is particularly useful for teaching and for Chinese medicine students. Most clinicians are familiar with the theories presented in the book. However, clinicians will certainly benefit from the vast range of classic literature cited in the book and from knowing how common clinical conditions are treated with different methods. Furthermore, Chapters 15 and 16 should be read by every practitioner to gain a deeper understanding of our role as acupuncturists.

***Zhen Zheng***

# Conference Report

## Australasian Acupuncture and Chinese Medicine Annual Conference (AACMAC)

**James Flowers**, **Wade James and John Deare**

The Australasian Acupuncture and Chinese Medicine Annual Conference (AACMAC) 2007 was held over three days from 18 to 20 May at the Brisbane Convention and Exhibition Centre. AACMAC is the largest annual Chinese medicine conference held in Australia. Over 300 practitioners, researchers and educators attended the conference, and over 60 national and international delegates presented on diverse topics in Chinese medicine. These ranged from clinical applications, practical workshops and theoretical papers to current issues in regulation and reports on research.

Topics covered all Chinese medicine modalities, including not just acupuncture and Chinese herbal medicine, but also moxibustion, massage, diet and exercise therapy. Presentations ranged from research on the physiological responses and effectiveness of various therapies, how to run and conduct a clinical trial, to how to write a case report. Clinical conditions discussed included Bell's palsy, chronic pain, infertility, insomnia, abdominal discomfort, diabetes, cancer, insomnia, scar tissue, hepatitis C, and sport performance. Topics in education and regulation were also discussed.

A special aspect of AACMAC conferences and a key to their success is the bringing together of clinicians, educators and researchers in the field of acupuncture and Chinese medicine. As the range of individual experiences varied considerably, short accounts from three participants are presented below.

### FROM JAMES FLOWERS: THE AACMA PRESIDENT'S VIEW

One highlight of the conference was the official launch of the *Australia Journal of Acupuncture and Chinese Medicine* (AJACM). After considerable planning, AACMA published the first issue of the Journal in 2006 and, at the time of the launch, the first issue of 2007 was in publication. Professor Charlie Xue of RMIT University formally launched the Journal. He congratulated AACMA and the Editorial Board for the standard of the Journal and stressed the importance and significance of a high quality peer-reviewed journal for the profession in Australia. Editor-in-Chief, Dr Zhen Zheng, made a very gracious and fitting speech of thanks to the Editorial Board for their hard work in making the Journal a reality. She also thanked the International Advisory Board, the Management Committee, staff and, importantly, the authors and reviewers without whom there would be no journal.

Another highlight of the conference was the bestowing of life membership upon two special guests: Maurice Mee Lee (AACMA member No 1) and Brian Bateman (AACMA member No 3). These two colleagues were part of the small band of pioneers of acupuncture in Australia. In 1974, a small group formed the Australian Acupuncture Association, a precursor organisation of AACMA. As Maurice Mee Lee said in his acceptance speech, the decision was made to set up a structure with built-in systems of accountability and transparency. This structure has served the association well ever since. I was quite overwhelmed by the occasion, awed by reflecting upon the difficulty of starting up an association way back then and knowing that we stand on the shoulders of giants. It was also the first spontaneous standing ovation I have experienced in my time in the profession.

### FROM WADE JAMES: A PRACTITIONER'S VIEW

I have attended a few AACMAC conferences now and I see a clear path of evolution. The organisation of the conference, from the registration to the final closing ceremony, has become a highly professional operation. As chair of a number of conference sessions, I observed three things: commitment, passion and enthusiasm from presenters.

The lecturers were clearly committed to their work. Clive Powell's experience of many years of running a practice was distilled into a no-nonsense approach to managing a successful clinic. Older practitioners nodded in agreement as he delivered his thoughts while newer practitioners looked a little shaken by the sometimes harsh reality of how to become a successful practitioner.

Other senior practitioners also delivered lectures filled with practical experience gleaned from years in clinic and their reflections on what works and what doesn't.

In the resserach sessions, I listened to the detail of research protocols as members of the audience, all clearly involved in research, debated the detail of research approaches that might yield significant results. It was a little esoteric, but every acupuncture clinic in Australia owes these researchers a debt of gratitude for the patients who, for example, contact us daily for fertility treatments after hearing about positive acupuncture research outcomes from Dr Caroline Smith.

Greg Williams and John Thompson presented new approaches to the use of Chinese medicine based on their personal journeys to China and Japan. These individuals have spent half a lifetime absorbing techniques and theoretical models. Their dedication to the pursuit of an understanding of Chinese medicine is greatly appreciated by practitioners who work 9–5 in a clinic, but are able to apply the fruits of their exploits.

I left with a sense of the commitment, passion and enthusiasm that the lecturers had for practice and their excitement at being able to share this with colleagues.

## FROM JOHN DEARE: A RESEARCHER'S VIEW

Once again there was a lot to see and do at the annual conference. The conference started with a large number of delegates attending the pre-conference sessions on the Friday afternoon. First up in one of the concurrent Friday workshops was keynote speaker, Paul Movsessian, who delivered a workshop on pulse diagnosis. Paul explained the significance of the pulse and in particular the Stomach Qi pulse. He explained that use of this pulse would allow the practitioner to determine the prognosis and needle technique to be employed. After the lecture, the attendees were broken up into groups to practise pulse-taking using the Kozato method of group consensus. The Kozato method is used in the Toyohari teaching school, which allows up to seven students to all agree on the pulse.

Another fascinating pulse session followed from Past AACMA President Stephen Janz and Past AACMA Vice President Jim Chalmers, who explained the use of the VAS pulse in auricular acupuncture. Stephen and Jim explained how using the VAS pulse on the wrist would allow for better point location in auriculotherapy. This was followed up with a workshop that gave a general introduction to this interesting system.

Saturday was packed with interesting lectures. The morning session in one room had Dr Zhen Zheng delivering a paper on the types of pain that acupuncture could treat and the related neural mechanisms and clinical evidence. The message was that clinicians need to learn to differentiate spontaneous pain and evoked pain. Dr Zheng used clinical and neurophysiological evidence to illustrate the varying effects of acupuncture on these two types of pain.

RMIT Master's degree student Sam Feng talked on the effect of acupuncture on temporal summation of pain in healthy humans from a randomised controlled study. This study found that electroacupuncture induced strong analgesia, which became more potent 24 hours after treatment. This observation is consistent with clinical situations, in which patients may or may not have immediate relief, but the effect often comes within 72 hours of treatment.

Dr Hong Xu from Victoria University spoke on her work involving the herb *Shang Zha* (hawthorn fruit) and its use in hyperlipidemia. Compared with other herbal formulae and herbs, she reported that this herb has been found to be the most effective in reducing serum cholesterol levels.

The Saturday afternoon sessions proved popular, with Dr Mark Strudwick from the University of Queensland presenting two papers. The first was an overview of imaging techniques and studies which shed light on the neurophysiological effects of acupuncture. His second talk was on point injection therapy. Dr Chris Zaslawski from the University of Technology, Sydney (UTS) discussed studies on the physical structure and unique substance of acupoints and meridians, a highly debatable topic. Chris had gathered this information from a recent training course held in China, which included academics from around the world. Finally, Master's degree student Christine Berle, also from UTS, spoke on her work in developing an original tool using Chinese syndromes differentiation of hepatitis C as an outcome measure for quantifying the clinical efficacy of acupuncture.

Sunday was very busy. Dr Caroline Smith of Adelaide University spoke on her current research into acupuncture administered at time of embryo transfer in IVF. She also covered the current literature and the effect on the pregnancy rate success. In addition, Heather Bruce spoke about her experience in dealing with infertility in the clinic and gave insights on how to help.

## CONFERENCE AWARDS

**Overall Best Paper:**
John McDonald for his paper on 'The Impact of Time on Acupuncture'.

**Best Research/Scientific Paper:**
Christine Berle for her paper on 'A Methodological Approach to Convert a Western Disease to TCM Patterns of Disharmony (*bian zheng*): An Assessment and Re-evaluation/Outcome Tool'.

**Best Paper on Clinical Practice:**
Greg Bantick for his workshop on 'The Clinical Application of Chinese Moxibustion Techniques'.

**Honourable Mention for first presentation at a conference:**
Bobbie Choy for her paper on 'Acupuncture, Chinese Medicine Practitioners and the Workers Compensation System: A National Survey'.

# National News

## The National Institute of Complementary Medicine: The Birth of a National Initiative

**Alan Bensoussan** PhD
Director, The National Institute of Complementary Medicine

The Federal Government has acknowledged the increasing importance of complementary medicine (CM) in Australia by establishing the National Institute of Complementary Medicine (NICM) on 15 June 2007 with a $4 million grant. The New South Wales Office of Science and Medical Research has supported the establishment of the Institute with a further $600 000. This latest government initiative supplements the announcement in December last year of $5 million in National Health and Medical Research Council Special Initiative Research Grants for complementary medicines.

### NICM WILL HELP FACILITATE AND CO-ORDINATE RESEARCH

'Preventative healthcare' and 'ageing well' are national research priorities and with substantial numbers of Australians using CM, we need to understand to what extent it can make a significant, cost-effective contribution to public health. NICM will build on existing expertise in CM research, foster collaborations and developing programs that build links across the sector and build human capacity in the field. It will be the vehicle for developing critical mass and shared infrastructure, establishing research priorities and gaining international recognition for Australian research activities in this important and growing field.

NICM is hosted at the University of Western Sydney, Campbelltown Campus and its core aims are to:

- Articulate national priorities in CM research, both basic and translational;
- Co-ordinate national collaboration across research themes and activities;
- Support capacity building through post-doctoral training – creating research workers able to support the industry's research needs as it expands nationally and internationally;
- Disseminate research findings to medical and health practitioners and the general public.

### PROGRESS

NICM has moved quickly to establish its organisation and to map out its strategy for the future. An interim management team has been established comprising of the Director Professor Alan Bensoussan, CEO Shelley Evans, Executive Officer Dr Phillip Cheras, Project Officer Ros Priest and Administrative Officer Natalie McCarthy. This team has broad expertise across the CM sector in addition to general management, marketing and communications skills. The management team is advised by an interim Consultative Group comprising Professor Stephen P Myers (Southern Cross University), Suzanne Pierce (NSW Office of Science & Medical Research), Professor Basil Roufogalis (University of Sydney) and Professor Marc Cohen (RMIT). An Interim Advisory Panel with expertise in organisational structures and strategic planning, business, finance, major research institutes and CM has also been established. Further information on NICM background and activities is available on our recently established website: www.nicm.edu.au.

### STAKEHOLDER CONSULTATION

NICM has recognised the importance of stakeholder involvement throughout its development. To this end, three major stakeholder forums were convened in Sydney to focus on issues of importance to CM researchers, the CM industry and practitioners. These forums canvassed opinions on the major issues relevant to NICM's core areas of activity and the means by which NICM could begin to address these. The outcomes from these forums have been incorporated into NICM's implementation plan which aims to establish NICM as a long-term, financially viable Institute.

### FUNDING CALL

NICM has developed its funding policy and recently announced a funding call for the establishment of the first NICM Collaborative Research Centres with an allocation of $1.8 million. The aim of the NICM Centre Funding Program is to provide funding for the establishment over a two-year period of three or four NICM Centres to pursue collaborative research on themes that address NICM

research priorities. The support will contribute to personnel costs. It is expected that NICM Collaborative Centres will:

- contribute new knowledge at a leading international level that falls within NICM Research Priorities;
- leverage NICM funds to maximise the amount of CM research being conducted in Australia;
- promote inter-disciplinary research integrating CM and other disciplines, in particular mainstream disciplines such as conventional medicine;
- increase the breadth and depth of CM research capacity in Australia; and
- promote the strategic distribution of funds being applied to CM research to maximise the overall benefit of CM research in Australia.

## IMPORTANCE OF NICM FOR CHINESE MEDICINE RESEARCH IN AUSTRALIA

The NICM Call for Funding for Collaborative Centres represents a unique opportunity for traditional Chinese medicine (TCM) to establish itself strongly in Australia. For too long individual researchers and relatively small research teams have worked independently and competed against each other for the small quantum of research funding available in the field. If the TCM community were successful in establishing a national Collaborative Centre in TCM under this funding scheme, this co-ordinated centre would provide a support vehicle for careful prioritising and planning of TCM research in Australia. Collaboration will mean that infrastructure may be accessed and shared without duplication. We may invest in further human capacity building to grow the number and quality of active TCM researchers and develop strong, multi-disciplinary research teams. Overall, an NICM Collaborative Centre in TCM would represent a major facelift (an analogy of potential interest to our ageing population) to TCM research and importantly, generate greater visibility of TCM through convincing evidence of its effectiveness, safety and cost-effectiveness.

## HOW CAN THE CHINESE MEDICINE COMMUNITY BECOME INVOLVED AND HELP?

At the stakeholder forums, interest was frequently expressed by practitioners to become involved in NICM research activities. NICM welcomes the opportunity to include Chinese medicine and other health practitioners in its database by registering through our website. This will enable us to send them our e-newsletter, which provides regular updates on NICM's activities. Practitioners could potentially participate in clinical trials as associate investigators, provide appropriately screened participants or even participate more actively through a post-graduate research training program. This call to establish National Collaborative Centres is competitive. There is no guarantee that a TCM application would be successful. The broader Chinese medicine community should actively seek to support the establishment of a National Collaborative Centre in TCM in all ways imaginable. The application deadline is 20 December 2007. This is a unique opportunity that has never been previously available to Chinese medicine and deserves the strongest support possible.

# International News

## Acupuncture in New Zealand

**Paddy McBride** MHSc(TCM)
President, New Zealand Register of Acupuncturists

The New Zealand Register of Acupuncturists (NZRA) celebrated thirty years of being an incorporated society at the recent AGM and Conference, which were held in Wellington at the beautiful Museum of New Zealand Te Papa Tongarewa. The road through these thirty years has not always been a smooth one but it would appear we are entering a new era in which acupuncture as a profession is increasingly being recognised as holding a very important role in the provision of health care for all New Zealanders.

### ACCIDENT COMPENSATION

Over recent years, NZRA has put a great deal of effort into building a close relationship with the Accident Compensation Corporation (ACC) – a Government-funded organisation that recognises acupuncture as a valid method of treatment for any New Zealander who has had an accident of any description. Along with osteopaths, chiropractors and physiotherapists, acupuncturists are able to treat injured New Zealanders and be paid by the Government for providing the service. Last year saw the launch of the ACC Treatment Profiles for acupuncture. Representing nearly eight years of work, this document covers every conceivable injury, with full description, possible complications and outline of the treatment protocol, together with the recommended number of treatments expected to resolve the injury. By the time the document was published, many of the ACC staff were referring to Qi and Blood stasis with relative ease and a much more relaxed relationship existed between the two organisations. This relationship is continuing to strengthen. As well as sponsoring the recent NZRA AGM and Conference, ACC provided a team of advisers who attended the whole weekend conference, providing information and support to all our members with regard to ACC matters or concerns.

### STATUTORY REGULATION

Statutory regulation has been another issue that has been all-consuming in recent years. In New Zealand we have the Health Practitioners Competency Assurance Act, which covers all registered health practitioners.

Doctors, physiotherapists, midwives, osteopaths and chiropractors are already covered under this Act and after endless meetings, discussions, disagreements and reconciliations, the various acupuncture groups throughout the country finally agreed that it was in the best interests of the profession to present a united front and apply to the Ministry of Health for similar recognition. Once again there were many hurdles to jump, but fortunately we were able to work through the process and the application was submitted to the Ministry late in 2006.

NZRA was notified in early August this year that the Minister of Health 'has approved acupuncture as an additional profession for inclusion in the scope of the Health Practitioners Competency Assurance Act 2003'. This is ground-breaking news for all members of NZRA. The full process of statutory regulation is likely to take many months, but acupuncture will now be recognised as part of primary health care in New Zealand.

### INTEGRATED HEALTHCARE PLAN

The Minister of Health here in New Zealand, Peter Hodgson, recently announced an initiative which will see practitioners of complementary and conventional medicine working more closely together to provide the best possible health care for all New Zealanders. The initiative is aimed at offering more treatment options for patients by combining the best of what conventional and complementary medicine can offer. Funds have been allocated to explore and assess the advantages and concerns of integrating the medical models and to determine the best methods of integration. The New Zealand Register of Acupuncturists welcomes this initiative and looks forward to working closely with those appointed by the Government to ensure a positive outcome. As acupuncture, osteopathy and chiropractic are already recognised by ACC, there is a firm base on which to build.

With a recent nation-wide survey finding that the majority of New Zealanders had visited a natural health practitioner

within the previous twelve-month period, it is clear that integrated medical care is the path to follow.

## ACUPUNCTURE RESEARCH

A very important development to come from the recent NZRA conference was the introduction of a new acupuncture research group. Dr David St George, a Kiwi who has recently returned home from the United Kingdom, gave a very inspiring presentation on the importance of developing research programs that work for us as acupuncturists. Dr St George has a strong interest in complementary and alternative health and was a member, then Chair, of the British Acupuncture Accreditation Board for several years. He was also involved in the setting up of the Bachelor of Science in Traditional Chinese Medicine at Middlesex University. We are very pleased to accept Dr St George's offer to guide us in the right direction with regard to research projects, and we have already had an overwhelming response from members of our organisation who wish to be involved.

## EDUCATION

In the past anyone who wanted to study acupuncture and Chinese medicine had to travel overseas to gain a qualification. We also have great numbers of practitioners who completed their education in their home countries and then moved here to New Zealand. Fortunately, for those wanting to study today, there are options closer to home. There are two main colleges of acupuncture and Chinese medicine in New Zealand: the New Zealand School of Acupuncture and TCM, which has campuses in both Wellington and Auckland; and the New Zealand College of Chinese Medicine, with campuses in Auckland and Christchurch. At the moment both Colleges offer the National Diploma of Acupuncture, but both are working to upgrade the qualifications to Bachelor level. By working closely with tertiary institutions in Australia, the Colleges are also ensuring that once the new qualifications are approved by the Tertiary Education Commission, there will again be parity with qualifications offered on both sides of the Tasman.

## CONCLUSION

It is clear that acupuncture and Chinese medicine are entering a new age of acceptance here in New Zealand. Whilst those of us who studied twenty or thirty years ago were thought to be somewhat 'out there', the students coming through the Colleges today are entering a world where acupuncture is increasingly accepted as mainstream medicine. More and more members of the public are coming to realise that acupuncture and Chinese medicine really is a complete healthcare package and are insisting that treatment is readily available. The ACC has been greatly influential in this regard. Although the first reason for a visit to an acupuncturist may be to recover from a lower back injury or a sprained ankle, patients quickly appreciate that there is so much more to it and are soon returning for treatment of more complex conditions. They also recommend it to friends and family and increasing numbers are beginning to see their practitioner of Chinese medicine as their primary health carer. It is an exciting time to be an acupuncturist in New Zealand.

# AJACM Instructions for Authors

The *Australian Journal of Acupuncture and Chinese Medicine* (AJACM) is the official journal of the Australian Acupuncture and Chinese Medicine Association Ltd (AACMA). It is a peer-reviewed journal published biannually and it has an Editorial Board and an International Advisory Board. The Instructions for Authors are available online from: www.acupuncture.org.au/ajacm.cfm.

## Aims and scope

AJACM acknowledges the diversity of Chinese medicine theories and practice, and encourages the integration of research, practice and education. It promotes the use of rigorous and appropriate research methodologies in the field of Chinese medicine. AJACM publishes original research articles, general papers, reviews, case reports and case series that will contribute to current practice knowledge and encourage future research directions. The Editorial Board also welcomes the submission of letters, opinions and commentaries.

Authors of randomised, controlled trials (RCTs) are encouraged to consult the CONSORT standards available from www.consort-statement.org/Statement/revisedstatement.htm.

Authors of systematic reviews are encouraged to consult the QUOROM statement: Moher D et al. Improving the quality of reports of meta-analysis of randomised controlled trials: the QUOROM statement. Lancet 1999;354:1896–1900 (Available from www.thelancet.com).

Case reports and case series are to follow the guidelines in Writing Chinese Medicine Case Reports: Guidlines for the Australian Journal of Acupuncture and Chinese Medicine by P Ferrigno, JD Ryan and JC Deare, available from www.acupuncture.org.au/ajacm.cfm.

The reporting of acupuncture treatment in clinical trials, case reports or case series needs to follow STRICTA guidelines, which are available from www.stricta.info/stricta.htm. Similarly, reports of herbal interventions should follow the guidlines outlined in the CONSORT statement, which was reprinted in AJACM (2006) volume 1, issue 1 (pp. 35–9), and is also available from www.annals.org.

All human and animal research must have been conducted in accordance with the National Health & Medical Research Council's standards on research ethics, available from www.nhmrc.gov.au/ethics/index.htm, or equivalent standard if conducted outside Australia. Authors should supply a copy of their ethics approval.

## Organisation of manuscripts

### GENERAL REQUIREMENTS

AJACM endorses the Uniform Requirements for Manuscripts Submitted to Biomedical Journals, which is available from www.icmje.org/ijmje.pdf.

### LENGTH OF MANUSCRIPT

Original research, general articles and reviews should not exceed 3000 words, excluding abstract and reference list, without the permission of the Editorial Board. Case reports and case series should not exceed 1500 words. Letters to the Editor and Book Reviews should not exceed 500 words.

### TITLE PAGE

The title page should include contact details of the authors, the manuscript's full title, short title, abstract and keywords. The title page should be included in the same file as the manuscript.

### ABSTRACT AND KEYWORDS

Abstracts should not exceed 300 words and, where applicable, contain background, aims, design, subjects and settings, interventions, outcome measures, results, discussion and conclusion. Up to six keywords may be used. Where possible, keywords should be those recommended in the *Index Medicus* Medical Subject Headings (MeSH) list.

### TEXT

Manuscripts of original research or review articles should have Introduction, Methods, Results, Discussion, Acknowledgments and References. Authors of other articles should use appropriate headings.

### CLINICAL COMMENTARY

All manuscripts should have a Clinical Commentary section, written in plain language for practitioners, describing the

clinical relevance of the article. This section should be less than 100 words in length and will also be included in the final article as a break-out box.

### ACKNOWLEDGMENTS

Acknowledgments should:

- specify academic and/or technical contributions;
- list the types of financial support; and
- disclose any possible conflicts of interest.

### REFERENCES

AJACM adopts the Vancouver referencing system, a summary of which is available from: library.curtin.edu.au/referencing/vancouver.pdf. The Journal encourages the use of citation managers such as EndNote.

In-text citations should use superscript Arabic numerals in the appearing order. The use of footnotes is strongly discouraged. Where there is supplementary comment in relation to a table or a figure, this should be presented below the table using alphabetical symbols.

References should be listed according to the order of their appearance in the text. Please refer to the following referencing examples.

1. WHO. Standard acupuncture nomenclature. 2nd ed. Manila: WHO Regional Office for the Western Pacific; 1993.
2. Cahn A, Carayon P, Hill C, Flamant R. Acupuncture in gastroscopy. Lancet 1978;28(1):182–3.

Abbreviation of journal titles should follow those used in the *Index Medicus*. Please consult the Entrez Journals Database, available from: www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Journals.

### FIGURES AND TABLES

Figures and tables should be numbered according to their order of appearance with Arabic numerals. Figures must be provided as separate files. Information provided in figures and tables should complement, but not duplicate, that in the text. A figure is to have a title and a self-explanatory legend below it. A table is to have a title above it. All symbols and abbreviations must be explained below the body of the table or figure.

## Submission of manuscripts

### PROCEDURE

All manuscripts should include a cover sheet and be submitted electronically as an e-mail attachment to ajacm@acupuncture.org.au. Authors should also send a hard copy of the manuscript with the signed original of the cover sheet to the Journal's postal address. The Editor-in-Chief will e-mail the correspondent author to confirm receipt of the manuscript and provide a reference number which should be used in all communications about the manuscript.

The Editorial Board will conduct an initial in-house review. The correspondent author will receive in one month of submission an e-mail notifying whether the manuscript:

- has passed the in-house review and has been sent for peer review; or
- has not been accepted through the in-house review.

For articles sent for peer review, AJACM will notify the correspondent author within three months of one of the following four decisions:

- acceptance with no changes;
- acceptance with minor changes;
- acceptance subject to major changes; or
- rejection.

Authors will be given up to two months to amend the manuscript. Once the amended manuscript has been accepted for publication, a galley copy will be sent to the correspondent author for confirmation prior to publication. The Editorial Board expects to receive the confirmation within seven days.

Twenty copies of reprints will be sent to the correspondent author after publication.

### FORMAT

Text and tables should be in Microsoft Word 2000 (or later version) format. ASCII, Rich Text Format or PDF files will not be accepted. Manuscripts should be typed, double-spaced with a margin of 20 mm on the top, bottom and both sides. Text should be in Times New Roman 12 point.

Graphics should be in minimum 300 dpi. They are not to be embedded in the text file, and should be submitted as separate files in JPEG or TIFF format.

### COVER SHEET

All submissions must include a completed cover sheet, which is available from www.acupuncture.org.au/ajacm.cfm. The cover sheet is a separate document to the title page. This must be submitted as a signed hard copy included with the hard copy of the manuscript. In-house review will not proceed until a cover sheet has been received.

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A completed copyright agreement form should be submitted once the paper has been accepted for publication. The correspondent author is responsible for obtaining the signature of all authors. An assignment of copyright form will be

e-mailed to the correspondent author after the final version of the manuscript has been received and approved for publication.

## Terminology and English

Acupuncture points should be named according to both Pinyin and the numerical code recommended by the World Health Organization (WHO. Standard Acupuncture Nomenclature, 2nd ed. Manila: WHO Regional Office for the Western Pacific; 1993).

Chinese herbs should be named according to both the Pinyin and the Latin name. AJACM reserves the right to correct Chinese herb names to conform with the Pharmacopoeia of China (Pharmacopoeia Commission. Pharmacopoeia of the People's Republic of China 2000. English ed. Beijing: Chemical Industry Press; 2000).

The terminology of Chinese medicine, such as Qi, Yin and Yang, should be in Pinyin and may use common English translations where applicable. It is recommended that each manuscript contain a glossary of Chinese medicine terms used.

Chinese characters should be in simplified form and will only be accepted as in-text characters. Downloads for using in-text Chinese characters in Microsoft Word can be obtained from the Microsoft website, www.microsoft.com.

The language used in AJACM is standard Australian English as per the Macquarie Dictionary. Manuscripts will be amended accordingly.

## Contact information

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