

# ACUPUNCTURE AND NECK PAIN

## About neck pain

Neck pain is one of the three most frequently reported complaints of the musculoskeletal system. Twenty-six to 71% of the adult population can recall experiencing an episode of neck pain or stiffness in their lifetime. Neck pain is usually a benign and self-limited condition, but can be disabling to varying degrees. As such, it has a large impact on healthcare expenditure, due to visits to healthcare professionals, and sick leave, disability and the related loss of productivity.(Trinh 2010)

Neck pain can be associated with symptoms that radiate to the arms or head, and may involve one or several neurovascular and musculoskeletal structures such as nerves, nerve roots, intervertebral joints, discs, bones, muscle and ligaments.

Conventional management includes advice to stay active and continue daily activities; exercise therapy; analgesics (e.g. paracetamol, NSAIDs, an opioid); muscle relaxants; corticosteroid spinal injections; and referral for consideration of surgery. However, there is a lack of strong evidence of effectiveness for most of these interventions (Hagen 2007, Luijsterburg 2007).

## References

Hagen KB et al. The updated Cochrane review of bedrest for low back pain and sciatica. *Spine* 2005; 30: 542-6.

Luijsterburg PAJ et al. Effectiveness of conservative treatments for the lumbosacral radicular syndrome: a systematic review. *Eur Spine J* 2007 Apr 6;(Epub ahead of print).

Trinh K et al, Cervical Overview Group. Acupuncture for neck disorders. *Cochrane Database of Systematic Reviews* 2006, Issue 3. Art. No.: CD004870. DOI: 10.1002/14651858.CD004870.pub3.

## How acupuncture can help

One systematic review found that acupuncture was effective in the short-term for the treatment of neck pain.(Fu 2009) Another review found moderate evidence that acupuncture relieves pain better than some sham treatments, measured at the end of the course of treatment, For inactive shams (e.g. TENS or electroacupuncture apparatus with the electrical supply disconnected) and waiting list controls acupuncture was superior also at short-term follow-up. (Trinh 2006)

Of those randomised controlled trials published since the Cochrane review (Trinh 2006: see above) five compared acupuncture to various types of sham treatment: acupuncture was superior in three (Liang 2009, 2010; Vas 2006) equivalent in one (Sahin 2010), and the results are unclear in one (Fu 2009). Given that sham acupuncture is usually to some extent an active treatment in its own right, not an inert placebo, these are encouraging results. In two other trials, acupuncture plus routine care was found to be better than routine care alone (Witt 2006; Chan 2009). In another, acupuncture plus massage produced better effects for cervical spondylosis patients than either therapy alone (Zhou 2005). Finally, one trial found that, according to international cost-effectiveness threshold values, acupuncture is a cost-effective treatment strategy in patients with chronic neck pain.(Willich 2006) (see Table overleaf for more details and also the Back Pain factsheet.)

Acupuncture can help relieve neck pain by:

- stimulating nerves located in muscles and other tissues, which leads to release of endorphins and other neurohumoral factors, and changes the processing of pain in the brain and spinal cord (Pomeranz 1987, Zhao 2008);
- reducing inflammation, by promoting release of vascular and immunomodulatory factors (Kavoussi 2007, Zijlstra 2003);
- improving muscle stiffness and joint mobility by increasing local microcirculation (Komori 2009), which aids dispersal of swelling.

## About traditional acupuncture

Acupuncture is a tried and tested system of traditional medicine, which has been used in China and other eastern cultures for thousands of years to restore, promote and maintain good health. Its benefits are now widely acknowledged all over the world, and in the past decade traditional acupuncture has begun to feature more prominently in mainstream healthcare in the UK. In conjunction with needling, the practitioner may use techniques such as moxibustion, cupping, massage or electro-acupuncture. They may also suggest dietary or lifestyle changes.

Traditional acupuncture takes a holistic approach to health and regards illness as a sign that the body is out of balance. The exact pattern and degree of imbalance is unique to each individual. The traditional acupuncturist's skill lies in identifying the precise nature of the underlying disharmony and selecting the most effective treatment. The choice of acupuncture points will be specific to each patient's needs. Traditional

acupuncture can also be used as a preventive measure to strengthen the constitution and promote general wellbeing.

An increasing weight of evidence from Western scientific research (see overleaf) is demonstrating the effectiveness of acupuncture for treating a wide variety of conditions. From a biomedical viewpoint, acupuncture is believed to stimulate the nervous system, influencing the production of the body's communication substances - hormones and neurotransmitters. The resulting biochemical changes activate the body's self-regulating homeostatic systems, stimulating its natural healing abilities and promoting physical and emotional wellbeing.

## About the British Acupuncture Council

With over 3000 members, the British Acupuncture Council (BAcC) is the UK's largest professional body for traditional acupuncturists. Membership of the BAcC guarantees excellence in training, safe practice and professional conduct. To find a qualified traditional acupuncturist, contact the BAcC on 020 8735 0400 or visit [www.acupuncture.org.uk](http://www.acupuncture.org.uk)

# ACUPUNCTURE AND NECK PAIN

## The evidence

| Research  | Conclusion  |
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| <b>Systematic reviews</b>   |   |
| <p>Fu L-M et al. Randomized controlled trials of acupuncture for neck pain: Systematic review and meta-analysis. <i>Journal of Alternative and Complementary Medicine</i> 2009; 15; 133-45.</p>       | <p>A systematic review that pooled data from 14 randomised controlled trials assessing acupuncture for neck pain. Nine meta-analyses addressing different clinical issues were carried out, seven of which yielded positive results. When the primary outcome was short-term pain reduction, acupuncture was found to be more effective than the control in the treatment of neck pain. Acupuncture was also found to be significantly more effective than sham acupuncture for pain relief. The reviewers concluded that their review confirmed the short-term effectiveness and efficacy of acupuncture in the treatment of neck pain.</p>  |
| <p>Trinh K et al. Cervical Overview Group. Acupuncture for neck disorders. <i>Cochrane Database of Systematic Reviews</i> 2006, Issue 3. Art. No.: CD004870. DOI: 10.1002/14651858.CD004870.pub3.</p> | <p>A systematic review that summarised the most current scientific evidence on the effectiveness of acupuncture for acute, subacute and chronic neck pain. A total of 10 trials of acupuncture treatments for chronic neck pain were included, but no trials were found of acupuncture for acute or subacute pain. For chronic mechanical neck disorders, there was moderate evidence that acupuncture was more effective for pain relief than some types of sham controls, measured immediately post-treatment. There was moderate evidence that acupuncture was more effective than inactive, sham treatments measured immediately post-treatment and at short-term follow-up. There was limited evidence that acupuncture was more effective than massage at short-term follow-up. For chronic neck disorders with radicular symptoms, there was moderate evidence that acupuncture was more effective than a wait-list control at short-term follow-up. The reviewers concluded that there is moderate evidence that acupuncture relieves pain better than some sham treatments, measured at the end of the treatment, and that those who receive acupuncture report less pain at short term follow-up than those on a waiting list. They also concluded that there is also moderate evidence that acupuncture is more effective than inactive treatments for relieving pain post-treatment and this is maintained at short-term follow-up.</p> |
| <b>Randomised controlled trials</b>   |   |
| <p>Liang Z et al. Assessment of a traditional acupuncture therapy for chronic neck pain: A pilot randomised controlled study. <i>Complementary Therapies in Medicine</i> 2011; 19: S26-S32.</p>       | <p>A randomised placebo-controlled trial that assessed the efficacy of traditional acupuncture for chronic neck pain in 190 patients by comparing the differences in symptoms, dysfunctions and quality of life. The Northwick Park Neck Pain Questionnaire (NPQ), visual analogue scale (VAS), Short Form (36) Health Survey (SF-36) and doctor's judgement were applied for measuring effectiveness. All the scores were improved after the intervention</p>  |

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|  | <p>and during follow-up (<math>p &lt; 0.01</math> vs. before the intervention). Compared with placebo, acupuncture resulted in better effectiveness outcomes in NPQ, VAS and in the vitality, social functioning and mental health domains of SF-36 (<math>p &lt; 0.05</math>). The researchers concluded that traditional acupuncture can relieve pain intensity and improve the quality of daily life with a relative long-term clinical effect in patients with chronic neck pain.</p>   |
| <p>Sahin N et al. Efficacy of acupuncture in patients with chronic neck pain--a randomised, sham controlled trial. <i>Acupuncture &amp; electro-therapeutics research</i> 2010; 35: 17-27.</p>                       | <p>A randomised controlled trial that compared the efficacy of electroacupuncture and sham acupuncture in the treatment of 31 patients with chronic neck pain. Patients were evaluated before and after therapy and 3 months later by Visual Analogue Scale (VAS) and the bodily pain subscale of the Short Form Health Survey-36 scale. VAS scores in both groups significantly reduced after therapy and at 3 months post-therapy, but the difference between groups was not significant. In respect of bodily pain, there was a significant improvement in the acupuncture group after therapy (<math>p &lt; 0.01</math>). The researchers concluded that their results suggested that stimulation of conventional acupuncture points was not generally superior to needling of nonspecific points on the neck, and both treatments were associated with improvement of symptoms. However, they stated that needles inserted into the neck are likely to be an inappropriate sham control for acupuncture.</p> |
| <p>Fu W-B et al. Analysis on the effect of acupuncture in treating cervical spondylosis with different syndrome types. <i>Chinese Journal of Integrative Medicine</i> 2009; 15: 426-30.</p>                          | <p>A randomised controlled trial that observed the clinical effect of real and sham acupuncture for cervical spondylosis with different syndrome types in 117 patients. The efficacy of treatment was evaluated with the Northwick Park Neck Pain Questionnaire (NPQ) and Visual Analogue Scale (VAS). The NPQ and VAS scores had significantly reduced in both groups at the end of treatment and for the 1st month of follow-up (<math>p &lt; 0.05</math>), but it did not last into the 3rd month of follow-up. The researchers concluded that acupuncture had a good immediate effect in treating cervical spondylosis, but its long-term effect is not satisfactory.</p>   |
| <p>Chan DKC et al. Electrical acustimulation of the wrist for chronic neck pain: A randomized, sham-controlled trial using a wrist-ankle acustimulation device. <i>Clinical Journal of Pain</i> 2009; 25: 320-6.</p> | <p>A single-blind randomised sham-controlled trial that investigated the value of adding electrical stimulation of acupuncture points on the wrist to a standardised program of neck exercises in 60 patients with chronic neck pain. Statistically significant improvements were found with electroacupuncture compared to sham at the end of the treatment and 1-month post-treatment for Numerical Rating Scale, Northwick Park Neck Pain Questionnaire and Pain Self-Efficacy Questionnaire. In the active and sham groups 38.9% and 8.3% of patients, respectively, reported a reduction of Numerical Rating Scale <math>&gt;50\%</math> at 1-month follow-up. The researchers concluded that electrical acustimulation of the wrist administered added value to standardised neck exercise for chronic neck pain, and that a 4-week course of treatment produced effects lasting 1-month post-treatment.</p>  |
| <p>Liang ZH et al. [Logistic regression analysis on therapeutic effect of</p>  | <p>A randomised sham-controlled trial that explored the main factors influencing the therapeutic effects of acupuncture on neck pain</p>  |

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acupuncture on neck pain caused by cervical spondylosis and factors influencing therapeutic effect] [Chinese]. *Zhongguo Zhenjiu* 2009; 29: 173-6.

caused by cervical spondylosis in 106 patients. Northwick Park Neck Pain Questionnaire (NPQ) was used to assess the patients' quality of life before and after the treatment. The effective rate was greater in the acupuncture group than in the sham group (75.5% vs. 52.8%,  $p < 0.05$ ). The researchers concluded that 'real' acupuncture has a better therapeutic effect on neck pain caused by cervical spondylosis than sham acupuncture, and a patient's clinical history with respect to attack frequency and duration of neck pain are factors that influence the clinical therapeutic effect.

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Witt CM et al. Acupuncture for patients with chronic neck pain. *Pain* 2006; 125: 98-106.

A randomised controlled trial that investigated the effectiveness of acupuncture in addition to routine care in 14,161 patients with chronic neck pain (duration >6 months) compared to treatment with routine care alone. Patients were randomly allocated to an acupuncture group or a control group receiving no acupuncture. All the patients were allowed to receive usual medical care in addition to study treatment. Neck pain and disability (NPAD Scale by Wheeler) were assessed after 3 months. Of the 14,161 patients, 1,880 were randomised to acupuncture and 1,886 to control, and 10,395 were included into a non-randomised acupuncture group. At 3 months, neck pain and disability improved by 16.2 to 38.3 and by 3.9 to 50.5 (difference 12.3;  $p < 0.001$ ) in the acupuncture and control group, respectively. Treatment effects were maintained for 6 months. Non-randomised patients had more severe symptoms at baseline and showed higher neck pain and disability improvement compared to randomised patients. The researchers concluded that treatment with acupuncture added to routine care in patients with chronic neck pain was associated with improvements in neck pain and disability compared to treatment with routine care alone.

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Vas J et al. Efficacy and safety of acupuncture for chronic uncomplicated neck pain: A randomised controlled study. *Pain* 2006; 126: 245-55.

A randomised controlled trial that compared the efficacy and safety of acupuncture with transcutaneous nerve stimulation-placebo (TENS-placebo) in the treatment of 123 patients with chronic uncomplicated neck pain. All the patients experienced neck motion-related pain intensity equal to or exceeding 30 on a visual analogue scale (VAS) of 0 to 100 mm. The primary outcome measure was the change in maximum pain intensity related to motion of the neck, 1 week after the final treatment. The change in the pain-VAS variable was greater in the acupuncture group, with improvements in quality of life (physical aspect), active neck mobility and reduced rescue medication were clinically and statistically significant. The researchers concluded that acupuncture is more effective than placebo treatment for routine treatment of chronic neck pain in clinical practice.

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Willich SN et al. Cost-effectiveness of acupuncture treatment in patients with chronic neck pain. *Pain* 2006; 125: 107-13.

A randomised controlled study that assessed costs and cost-effectiveness of additional acupuncture treatment in 3,451 patients with chronic neck pain compared to patients receiving routine care alone. Resource use and health related quality of life (SF-36) at baseline and after 3 months were assessed. The main outcome parameters were direct and indirect cost differences during the 3 months study period and the incremental cost-effectiveness ratio (ICER) of acupuncture treatment. Acupuncture

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treatment was associated with significantly higher costs over the 3-month study duration compared to routine care (925.53 vs. 648.06; mean difference: 277.47). This cost increase was mainly due to costs of acupuncture (361.76). The ICER was 12,469 per QALY gained and proved robust in additional sensitivity analyses. Beyond the 3 months study duration, acupuncture might be associated with further health economic effects. The researchers concluded that, according to international cost-effectiveness threshold values, acupuncture is a cost-effective treatment strategy in patients with chronic neck pain.

Zhou JW et al. [Multicenter randomized controlled study on acupuncture-massage comprehensive program for treatment of cervical spondylosis of arterial type]. *Zhongguo Zhen Jiu* 2005; 25: 227-31.

A randomised controlled trial that looked at the clinical value of acupuncture compared to or used with massage in 180 patients with cervical spondylosis of the arterial type (CSA). Multiple-dimensional indexes were used to evaluate the therapeutic effect and safety. The cured-markedly effective and the effective rate were 68.3% and 88.3% in the acupuncture-massage group, 51.7% and 75.0% in the acupuncture group, and 50.0% and 76.7% in the massage group, respectively, the acupuncture-massage group being better than the other two groups ( $p < 0.05$ ). The total cumulative scores for symptoms in the three groups decreased significantly (all  $p < 0.01$ ), the acupuncture-massage group being superior to the other two groups ( $p < 0.05$ ). The physical signs in the three groups improved significantly ( $p < 0.01$ ), with no significant differences among the groups ( $p > 0.05$ ). The time to clinical effect in the acupuncture-massage group was shorter than that in the other two groups ( $p < 0.05$  or  $p < 0.01$ ); and no adverse effects were found in the 3 groups. The researchers concluded that acupuncture plus massage has a definite therapeutic effect on cervical spondylosis of arterial type, is safe, and is more effective than simple acupuncture or the simple massage.

### Research on mechanisms for acupuncture

Komori M et al. Microcirculatory responses to acupuncture stimulation and phototherapy. *Anesth Analg* 2009; 108: 635-40.

Experimental study on rabbits in which acupuncture stimulation was directly observed to increase diameter and blood flow velocity of peripheral arterioles, enhancing local microcirculation.

Zhao ZQ. Neural mechanism underlying acupuncture analgesia. *Prog Neurobiol* 2008; 85: 355-75.

Review article that discusses the various peripheral and central nervous system components of acupuncture anaesthesia in detail.

Kavoussi B, Ross BE. The neuroimmune basis of anti-inflammatory acupuncture. *Integr Cancer Ther* 2007; 6: 251-7.

Review article that suggests the anti-inflammatory actions of traditional and electro-acupuncture are mediated by efferent vagus nerve activation and inflammatory macrophage deactivation.

Zijlstra FJ et al. Anti-inflammatory actions of acupuncture. *Mediators Inflamm* 2003; 12: 59-69.

An article that suggests a hypothesis for anti-inflammatory action of acupuncture: Insertion of acupuncture needles initially stimulates production of beta-endorphins, CGRP and substance P, leading to further stimulation of cytokines and NO. While high

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levels of CGRP have been shown to be pro-inflammatory, CGRP in low concentrations exerts potent anti-inflammatory actions. Therefore, a frequently applied 'low-dose' treatment of acupuncture could provoke a sustained release of CGRP with anti-inflammatory activity, without stimulation of pro-inflammatory cells.

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Pomeranz B. Scientific basis of acupuncture. In: Stux G, Pomeranz B, eds. Acupuncture Textbook and Atlas. Heidelberg: Springer-Verlag; 1987:1-18.

Needle activation of A delta and C afferent nerve fibres in muscle sends signals to the spinal cord, where dynorphin and enkephalins are released. Afferent pathways continue to the midbrain, triggering excitatory and inhibitory mediators in spinal cord. Ensuing release of serotonin and norepinephrine onto the spinal cord leads to pain transmission being inhibited both pre- and postsynaptically in the spinothalamic tract. Finally, these signals reach the hypothalamus and pituitary, triggering release of adrenocorticotrophic hormones and beta-endorphin.

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### **Terms and conditions**

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