British Acupuncture Council

# ACUPUNCTURE AND THYROID DISEASE

## About thyroid disease

**Thyroid disease includes hypothyroidism, a clinical consequence of deficient secretion by the thyroid gland, and hyperthyroidism, where overproduction of thyroid hormone leads to a state of thyrotoxicosis, (Weetman 2003).**

Overt hypothyroidism is diagnosed by a serum thyroid-stimulating hormone (TSH) concentration above the normal reference range and a serum free thyroxine (FT4) concentration below the reference range (BTA 2006). Clinical features may be absent or present. Subclinical hypothyroidism is diagnosed by a TSH concentration above the reference range with an FT4 concentration within the reference range (BTA 2006). Clinical features are usually absent.

In the UK, hypothyroidism is usually due to autoimmune hypothyroidism or thyroid damage after surgery or radioactive iodine therapy.(Wheetman 2003). It may be associated with a goitre (Hashimoto's thyroiditis) or without (atrophic thyroiditis or primary myxoedema). The prevalence of overt hypothyroidism is 1.9% in women and 0.1% in men (Tunbridge 977), and of subclinical hypothyroidism is about 8% in women and 3% in men in the UK.(Vanderpump 1995).

The most common symptoms are tiredness, weight gain, constipation, aches, dry skin, lifeless hair and feeling cold. Hypothyroidism is treated with levothyroxine.

Overt hyperthyroidism is diagnosed when TSH is suppressed and FT4 or free tri-iodothyronine (FT3) levels are higher than the normal reference range (Nygaard 2007). Subclinical hyperthyroidism is diagnosed when TSH is suppressed but FT4 and FT3 levels are within the normal reference range. Clinical symptoms and signs are typically absent, mild, or non-specific in people with subclinical hyperthyroidism. (BTA 2006) The prevalence of hyperthyroidism is about 2%, and it is about 10 times as common in women as men (Tunbridge1977; Vanderpump 1995). The prevalence of subclinical hyperthyroidism is less than 2% in adults (AACE Thyroid Task Force 2002). Thyroid eye disease affects about 400,000 people in the UK (0.66%) (Cawood 2004).

Primary hyperthyroidism is due to excessive production of thyroid hormone caused by thyroid overactivity. The most common cause is Graves' disease, an autoimmune disorder. Ophthalmopathy occurs in 25–50% of people with Graves' disease (Cooper 2004; Reid and Wheeler 2005)

Symptoms of thyrotoxicosis include breathlessness, palpitations, hyperactivity, emotional lability, insomnia, irritability, nervousness, anxiety, exercise intolerance, fatigue, muscle weakness, diarrhoea, increased sweating, increased appetite with weight loss or gain, infertility, polyuria, thirst, generalised itch, and reduced libido and gynaecomastia in men. Complications include Graves' ophthalmopathy; thyrotoxic

crisis; atrial fibrillation; congestive cardiac failure; and increased risk of miscarriage, eclampsia, premature labour, low birthweight and neonatal thyrotoxicosis, when it is untreated during pregnancy (Cooper 2003; Weetman 2003). Hyperthyroidism is treated with drugs (carbimazole, propylthiouracil, beta-blockers), radioiodine and surgery.

## References


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# How acupuncture can help

This factsheet focuses on the evidence for acupuncture in thyroid disease, both hypothyroidism and hyperthyroidism.

One randomised controlled trial (RCT) found that the use of moxibustion separated from the skin by a layer of aconite herbal ‘cake’, in addition to levothyroxine, can improve clinical symptoms and thyroid function in patients of Hashimoto's thyroiditis compared with levothyroxine alone (Xia 2012). An observational study found that acupuncture may be an alternative to treatment with levothyroxine for subclinical hypothyroidism (Luzina 2011).

Three RCTs have looked at acupuncture for hyperthyroidism. One found that acupuncture combined with acupressure is effective for treating infiltrative exophthalmos (bulging eyes, a common symptom in thyroid eye disease), and more effective than medication (Xu 2011). Another found that the addition of acupuncture to medication for hyperthyroid exophthalmos may not only enhance the therapeutic effects of medication, but also reduce the side effects. (Xia 2010) And, a third found that pricking therapy has a definite therapeutic effect on Graves' disease, via regulation of thyroid function (Li 2006).

In general, acupuncture is believed to stimulate the nervous system and cause the release of neurochemical messenger molecules. The resulting biochemical changes influence the body's homeostatic mechanisms, thus promoting physical and emotional well-being.

Research has shown that acupuncture treatment may specifically help in thyroid disease by:

- Increasing free thyroxine (FT4) and free tri-iodothyronine (FT3) levels in hypothyroidism (Xia 2012; Hao 2009; Hu 1993);
- Decreasing serum tri-iodothyronine (TT3), total thyroxine (TT4), free T3 (FT3) and free T4 (FT4) levels and increasing supersensitive thyrotropin (S-TSH) levels in hyperthyroidism (Li 2006);
- Acting on areas of the brain known to reduce sensitivity to pain and stress, as well as promoting relaxation and deactivating the ‘analytical’ brain, which is responsible for anxiety and worry (Hui 2010; Hui 2009);
- Increasing the release of adenosine, which has antinociceptive properties (Goldman 2010);
- Improving muscle stiffness and joint mobility by increasing local microcirculation (Komori 2009), which aids dispersal of swelling;
- Reducing inflammation, by promoting release of vascular and immunomodulatory factors (Kavoussi 2007);

# 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 well-being.

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 well-being.

# 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

# ACUPUNCTURE AND THYROID DISEASE

## The evidence

| Research | Conclusion |
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| **Randomised controlled trials** | |
| Xia Y et al. Effect of aconite cake-separated moxibustion at Guanyuan (CV 4) and Mingmen (GV 4) on thyroid function in patients of Hashimoto's thyroiditis [Article in Chinese]. Zhongguo Zhen Jiu 2012; 32(2): 123-6. | A randomised controlled trial that looked at the effects of aconite cake-separated moxibustion plus levothyroxine on thyroid function in 85 patients of Hashimoto's compared with levothyroxine alone. The clinical total effective rate and effective rate of thyroid function in moxibustion group were 25.0% (10/40) and 87.5% (35/40) respectively and, in western medication group, 7.5% (3/40) and 57.5% (23/40) respectively, with significant differences between the groups in favour of moxibustion (both $p<0.05$). Serum free thyroxine index (FT4) had increased significantly in the moxibustion group after treatment ($p<0.01$). Serum supersensitive thyrotropin (S-TSH) was lower in the moxibustion group than in the levothyroxine group. There was no significant difference in serum FT4 and free tri-iodothyronine (FT3) between the moxibustion group and the levothyroxine group. The researchers concluded that aconite cake-separated moxibustion added to levothyroxine can improve clinical symptoms and thyroid function in patients of Hashimoto's thyroiditis compared with levothyroxine alone. |
| Xu WM et al. Efficacy observation on infiltrative exophthalmos treated with acupuncture and acupoint massage [Article in Chinese]. Zhongguo Zhen Jiu. 2011; 31(2): 101-4. | A randomised controlled trial that looked at the clinical efficacy of acupuncture combined with acupressure on infiltrative exophthalmos in hyperthyroidism. Forty five patients with infiltrative exophthalmos allocated to acupuncture plus acupressure or medicine (dexamethasone, methotrexate and prednisone). The exophthalmos extents were 20.27 mm before and 18.11 mm after treatment with acupuncture plus acupressure and were 20.34 mm before and 19.47 mm after medication (both $p<0.01$). The improvement was significantly greater with acupuncture plus acupressure than with medication ($p<0.01$). The total effective rate with acupuncture plus acupressure (83.3%, 40/48) was also significantly better than that with medication (53.8%, 21/39), and with fewer unwanted effects. The researchers concluded that acupuncture combined with acupressure is effective for treating infiltrative exophthalmos, and more effective than medication. |
| Xia Y et al. Therapeutic effect and side effect of treatment on hyperthyroid exophthalmos with the combination of acupuncture and medication [Article in Chinese]. Zhongguo Zhen Jiu 2010; 30(10): 806-9. | A randomised controlled trial that compared the effects and side effects of acupuncture plus medication (thiamazole and levothyroxine) with medication only in 52 patients with hyperthyroid exophthalmos. Improvement in the objective markers of eye syndrome was greater in the acupuncture plus medication group than in the medication alone group ($p<0.01$). In the medication alone group, 4 patients had hypoleucocytosis, 3 developed a rash and 3 had aggravated symptoms of exophthalmos, while no such side effects were seen in the acupuncture and medication group. However, 8 cases of haemorrhage and 8 of hematoma were seen in the |

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| | acupuncture plus medication group. The researchers concluded that the addition of acupuncture to medication for hyperthyroid exophthalmos may not only enhance the therapeutic effects of medication, but also reduce the side effects. |
| Li GL et al. Observation on therapeutic effect of pricking therapy on Graves' disease [Article in Chinese]. Zhongguo Zhen Jiu 2006; 26(11): 769-71. | A randomised controlled trial that looked at the therapeutic effect of pricking therapy on Graves' disease and its effects on thyroid function. Sixty patients were allocated to either pricking therapy or medication (tapazole). The total effective rate was 93.3% in the pricking therapy group and 76.7% in the tapazole group, with a significant difference between the two groups in favour of pricking therapy ($p<0.05$). After treatment, serum tri-iodothyronine (TT3), total thyroxine (TT4), free T3 (FT3) and free T4 (FT4) had decreased significantly in both groups ($p<0.01$), with no significant differences between the 2 groups, and supersensitive thyrotropin (S-TSH) levels had increased significantly ($p<0.01$). Thyroxine receptor antibody (TRAb) had changed significantly in the pricking therapy group ($p<0.01$) but not in the tapazole group ($p>0.05$). The researchers concluded that pricking therapy has a definite therapeutic effect on Graves' disease, via regulation of thyroid function. |

## Other clinical studies

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| Luzina KÉ et al. The influence of acupuncture on the quality of life and the level of thyroid-stimulating hormone in patients presenting with subclinical hypothyroidism [Article in Russian]. Vopr Kurortol Fizioter Lech Fiz Kult 2011; (5): 29-33. | An observational study including 27 female patients with subclinical hypothyroidism (i.e. arthralgias and myalgias, and elevated levels of thyroid-stimulating hormone but normal concentrations of thyroid hormones) that looked at the effects of body and ear acupuncture on quality of life and thyroid-stimulating hormone levels. The treatment resulted in a significant decrease in the number and severity of the initial clinical symptoms; thyroid-stimulating hormone levels fell to the physiological values and quality of life became comparable with those of healthy women. The researchers concluded that acupuncture may be an alternative to treatment with levothyroxine for subclinical hypothyroidism. |
| Hu G et al. A study on the clinical effect and immunological mechanism in the treatment of Hashimoto's thyroiditis by moxibustion. J Tradit Chin Med 1993; 13(1): 14-8. | An observational study in which 71 patients with Hashimoto's thyroiditis were treated with moxibustion and their immune function and thyroid function assessed. Moxibustion reduced thyroid antibodies in the blood of patients with hypothyroidism leading to improved thyroid function. It also lowered thyroid antibody secretory levels and the antibody-dependent cell-mediated cytotoxicity activities of lymphocytes. In addition, the action of moxibustion in reducing the secretion of thyroid antibodies was found to be related to its action of regulating the proportions of T lymphocyte subsets. The researchers concluded that their results indicate that the treatment of Hashimoto's thyroiditis by moxibustion is probably accomplished through its effect on the regulation of the relationship among the T lymphocyte subsets. |

## Possible mechanisms of acupuncture

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| Goldman N et al. Adenosine A1 receptors mediate local anti- | A study showing that the neuromodulator adenosine, which has anti-nociceptive properties, was released during |

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| nociceptive effects of acupuncture. Nat Neurosci 2010; May 30. | acupuncture in mice, and that its anti-nociceptive actions required adenosine A1 receptor expression. Direct injection of an adenosine A1 receptor agonist replicated the analgesic effect of acupuncture. Inhibition of enzymes involved in adenosine degradation potentiated the acupuncture-elicited increase in adenosine, as well as its anti-nociceptive effect. The researchers concluded that their observations indicate that adenosine mediates the effects of acupuncture and that interfering with adenosine metabolism may prolong the clinical benefit of acupuncture. |
| Hui KK et al. Acupuncture, the limbic system, and the anticorrelated networks of the brain. Auton Neurosci 2010; 157: 81-90. | Studies have shown that acupuncture stimulation, when associated with sensations comprising deqi, evokes deactivation of a limbic-paralimbic-neocortical network, as well as activation of somatosensory brain regions. These networks closely match the default mode network and the anti-correlated task-positive network. The effect of acupuncture on the brain is integrated at multiple levels, down to the brainstem and cerebellum and appears to go beyond either simple placebo or somatosensory needling effects. Needling needs to be done carefully, as very strong or painful sensations can attenuate or even reverse the desired effects. Their results suggest that acupuncture mobilises the functionally anti-correlated networks of the brain to mediate its actions, and that the effect is dependent on the psychophysical response. They discuss potential clinical application to disease states including chronic pain, major depression, schizophrenia, autism, and Alzheimer's disease. |
| Hao C et al. Effects of Fire-needle on thyroid pathomorphology of rats with hypothyroidism. Journal of Shanxi College of Traditional Chinese Medicine 2009-05. | An animal study that looked at the effects of warming and tonifying with fire needles on a rat model of the hypothyroidism. After 4 weeks of treatment, the free thyroxine (FT4) and free tri-iodothyronine (FT3) levels were increased. |
| Hui K.K.-S. The salient characteristics of the central effects of acupuncture needling: limbic-paralimbic-neocortical network modulation. Human Brain Mapping 2009; 30: 1196-206. | This study assessed the results of fMRI on 10 healthy adults during manual acupuncture at 3 acupuncture points and a sham point on the dorsum of the foot. Although certain differences were seen between real and sham points, the hemodynamic and psychophysical responses were generally similar for all 4 points. Acupuncture produced extensive deactivation of the limbic-paralimbic-neocortical system. Clusters of deactivated regions were seen in the medial prefrontal cortex, the temporal lobe and the posterior medial cortex. The sensorimotor cortices, thalamus and occasional paralimbic structures such as the insula and anterior middle cingulate cortex showed activation. The researchers concluded that their results provided additional evidence that acupuncture modulates the limbic-paralimbic-neocortical network. They hypothesised that acupuncture may mediate its analgesic, anti-anxiety, and other therapeutic effects via this intrinsic neural circuit that plays a central role in the affective and cognitive dimensions of pain. |
| Komori M et al. Microcirculatory responses to acupuncture stimulation and phototherapy. Anesth Analg 2009; | Experimental study on rabbits in which acupuncture stimulation was directly observed to increase diameter and blood flow velocity of peripheral arterioles, enhancing local |

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| 108: 635-40. | microcirculation. |
| 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. |

## Terms and conditions

The use of this fact sheet is for the use of British Acupuncture Council members and is subject to the strict conditions imposed by the British Acupuncture Council details of which can be found in the members area of its' website www.acupuncture.org.uk.