

## Acupuncture

### What is Acupuncture?

There are two distinct systems of acupuncture with very different theoretical bases:

#### 1. Meridian or Body Acupuncture.

Body acupuncture, the most familiar Chinese medicine approach to Westerners, involves the placement of needles in the meridian points.<sup>1</sup> Needles are not hollow like injection or IV needles. They are usually 0.22-0.25 mm in diameter (much smaller than needles used in Western medicine) and of variable lengths. A typical acupuncture session may include the insertion of anywhere from a few needles to dozens of them. Practitioners are taught very specific ways to locate each point based on various anatomical markers. For example, Pericardium 6 (the 6<sup>th</sup> point on the pericardium meridian) is two finger widths up the arm away from wrist crease between two of the forearm tendons.<sup>2</sup> This point is stimulated by motion-sickness bracelets, which have become increasingly popular in recent years and have shown benefit in some studies.<sup>3</sup>

Acupuncture points, or *jing*, are located along chi pathways, which are also known as meridians. Meridians follow paths longitudinally, or sometimes internally-externally in the body. There are also collaterals (*luo*), which follow horizontal patterns. *Jing-luo* regulate the flow of chi and the balance of yin and yang in a person. Illness arises when flow through them becomes blocked or imbalanced. There are 361 acupuncture points along 20 meridians (numbers may vary slightly, depending on the acupuncture tradition). Photos of each meridian, with detailed descriptions, can be viewed at [chiro.org](http://chiro.org) or [acumedico.com](http://acumedico.com). All of these factors come into play when an acupuncturist is trying to determine where to insert needles. Different meridians are named after different organs, but more than just the organs themselves, these energy pathways are governed by the properties or functions that given organs are said to represent. Points often have evocative names, such as “Supreme Spring” and “Woodworm Ditch.”<sup>2</sup>

Key degrees and certifications incorporating Chinese medicine include the following:

- DAc—Diplomate of Acupuncture
- DOM—Doctor of Oriental Medicine
- LAc or LicAc—Licensed Acupuncturist
- MAc—Master of Acupuncture
- MOM—Master of Oriental Medicine
- OMD—Oriental Medical Doctor
- RAc—Registered Acupuncturist
- CAc—Certified Acupuncturist (usually a physician trained in acupuncture)

## 2. Microsystem Acupuncture.

Microsystem acupuncture works very differently as compared to body (or meridian) acupuncture. The term “microsystem acupuncture” was introduced by Dr. Ralph Alan Dale at the 1974 Third World Symposium on Acupuncture and Chinese Medicine to distinguish it from the traditional body or macro-acupuncture system.

Microsystem acupuncture is based on particular somatotopic fields comprising specific points of correspondence. That is, a specific part of the body—such as the ear, scalp, foot, hand or tongue—has a microsystem of points that is mapped out to be used to treat the entire body. That map is called a somatotopic map. It is similar to the somatotopic homunculus, the map of the cerebral hemispheres that shows which parts of the body are connected with which parts of the brain. Each of the microsystem points has a clearly defined correlation to a particular organ or function and may be used for diagnosis as well as treatment.<sup>4,5</sup> Several theoretical models have been proposed to explain the microsystems, including the holographic model.<sup>6,7</sup>

**Battlefield Acupuncture** is a 5-point protocol derived from the auricular microsystem, a map of acupuncture points on the ear that are held to be connected to other parts of the body. Many VA sites and Department of Defense sites offer [Battlefield Acupuncture](#) (BFA). Battlefield acupuncture was developed by Dr. Richard Niemtow in 2001 as a way of relieving pain that could even be used in wartime.<sup>8</sup> It involves the insertion of extremely small, gold-plated needles into five specific acupoints.<sup>9</sup> These are left in until they fall out by themselves, usually after a period of 2-7 days.<sup>2</sup> It works well to have people receive the needles during group visits.<sup>10</sup>

**National Acupuncture Detoxification Association (NADA) Protocol** is another 5-point ear acupuncture protocol used for stress, emotional trauma and adjunctive addiction treatment.<sup>11</sup> This protocol involves gentle placement of up to five sterilized needles into specific sites on each ear. The recipients sit quietly in a group setting for 30 to 45 minutes allowing the treatment to take effect. A variety of health care practitioners can get trained in this protocol and certified as Auricular Detoxification Specialists. These trainings are conducted all over the country by NADA-certified trainers through public and private agencies, acupuncture schools, and individual practitioners. State laws vary when it comes to non-acupuncturists practicing “acudetox.”

## How Acupuncture Works

There are many theories about how acupuncture works from a physics/biochemistry perspective.<sup>12</sup> Traditionally, the Chinese hold that health is related to the flow of qi (energy) and acupuncture allows it to flow.<sup>13</sup> Western researchers have proposed many theories based on our current scientific understanding, including that acupuncture may stimulate release of certain neurotransmitters, that it causes cells to release chemicals that bind to opioid receptors and block pain, and/or that it alters hormone levels and white blood cell activity.<sup>14</sup> Purine-based signaling,<sup>15</sup> nitric oxide release,<sup>16</sup> and stimulation of multiple biochemical mechanisms that promote homeostasis<sup>17</sup> have also been suggested as potential mechanisms of action.<sup>18</sup> Acupuncture points have a slightly warmer temperature than other points on the body.<sup>19</sup> A 2020

study on mice found that after about 3 minutes of foot acupuncture, blood flow to a mouse's eyes significantly increased when specific acupuncture points were used.<sup>20</sup>

Several theories about how acupuncture works relate to the central nervous system. Functional MRI studies have shown that needling specific acupuncture points (actual ones only, not sham ones) does indeed stimulate certain parts of the brain to change activity.<sup>21,22</sup> Inhibition of the microglia in the central nervous system may also play a role.<sup>23</sup> In vitro studies indicate that acupuncture prevents apoptosis (cell death) in a variety of neurological diseases.<sup>24</sup> Manual and electroacupuncture seem to stimulate different parts of the brain.<sup>25</sup> Acupuncture increases body production of neurotrophic factors which can stimulate the creation of new nervous system pathways.<sup>26</sup> In animal studies, it also dilates blood vessels in the cerebral cortex<sup>27</sup> and promotes neuroplasticity.<sup>28</sup> A 2018 review of 44 fMRI studies of different parts of the brain found that “true” acupuncture alters the activity of functional networks in the brain relative to sham acupuncture, where random points are used.<sup>29</sup>

## Who Can Use Acupuncture?

Most people can use acupuncture. Children may do better with acupressure, as may others who tend to dislike needles. Remind people that the needles are a much smaller diameter than IV or injection needles, and they are not hollow; most people find that this makes them much less painful. Some acupuncturists will, in lieu of needles, use a small amount tape to attach small seeds to acupuncture points to stimulate them that way instead. One advantage of acupuncture is that needles can be inserted at a distance from a particularly painful, tender, or inflamed area and still have potential benefit.

## When to Use Acupuncture: Efficacy

Because acupuncture is used much more widely in the U.S. than any other aspect of Chinese medicine, and because it has been researched much more thoroughly, it has received the most attention when it comes to research on efficacy and safety. Acupuncture research is challenging to do. Having a placebo group is tricky and having “sham” acupuncture—using needles in non-points—sometimes proves superior to no treatment at all and equivalent in effect to “real” acupuncture. In addition, like so many complementary integrative health (CIH) approaches, acupuncture therapy is individualized, so two people with the same Western medical diagnosis may be treated in very different ways.

In January 2014, the Department of Veterans Affairs Evidence-Based Synthesis Program (ESP) Center, created an evidence map for acupuncture.<sup>30</sup> This “review of reviews” created visual overviews of the distribution of evidence for acupuncture and created summaries that could be used to “inform policy and clinical decision making.” 183 systematic reviews met inclusion criteria. Three main domains were given attention: pain (65 studies), mental health (20 studies), and wellness (48 studies).

As of the time of the creation of the evidence maps in 2014, research was most favorable for acupuncture as a treatment for the following<sup>21</sup>:

- Cancer adverse effects
- Chronic pain
- Irritable bowel syndrome (IBS)
- Migraine



- Depression
- Dysmenorrhea
- Headache (in general)
- Osteoarthritis
- Postoperative nausea and vomiting
- Smoking cessation

In the past few years, there has been a huge increase in the number of available reviews and meta-analyses focused on acupuncture. While almost all conclude that more research is needed, studies have shown favorable results for all of the following conditions (and the list is by no means exhaustive):

- Alzheimer's disease<sup>31</sup>
- Analgesia for acute pain conditions<sup>32</sup>
- Angina (stable)<sup>33</sup>
- Allergic rhinitis<sup>34</sup>
- Anxiety<sup>35</sup>
- Bell's palsy<sup>36</sup>
- Cancer adverse effects
- Carpal tunnel syndrome<sup>37</sup>
- Chronic back pain<sup>38</sup>
- Chronic knee pain<sup>39</sup>
- Chronic low back pain<sup>40,41</sup>
- Chronic pain,<sup>1,42,43</sup> including in group treatments<sup>44</sup>
- Chronic Obstructive Pulmonary Disease<sup>43,45</sup>
- Depression<sup>46</sup>
- Dry eyes<sup>47</sup>
- Dysmenorrhea<sup>48,49</sup>
- Endometriosis pain<sup>50</sup>
- Fibromyalgia<sup>51</sup>
- Functional constipation<sup>52</sup>
- Functional dyspepsia<sup>53</sup>
- Gastroesophageal reflux<sup>54</sup>
- Headaches
- Insomnia related to depression<sup>55</sup>
- Male sexual function<sup>56</sup>
- Migraine without aura<sup>57</sup>
- Myofascial pain<sup>58</sup>
- Opioid addiction<sup>59</sup>
- Osteoarthritis of the knee<sup>60</sup>
- Osteoporosis<sup>61</sup>
- Parkinson's disease<sup>62,63</sup>
- Postoperative pain, nausea/vomiting, anxiety<sup>64</sup>
- Premenstrual syndrome<sup>65</sup>
- Shingles pain<sup>66</sup>
- Temporomandibular joint disorder<sup>67</sup>
- Tension-type headaches<sup>68</sup>
- Tobacco use<sup>69</sup>
- Weight loss<sup>70</sup>

Recent reviews have *not* shown benefit for acupuncture for dry mouth,<sup>71</sup> hip osteoarthritis,<sup>72</sup> alcohol withdrawal,<sup>73</sup> carpal tunnel syndrome,<sup>74</sup> rheumatoid arthritis,<sup>75</sup> hypertension,<sup>76</sup> or cancer-related pain.<sup>77,78</sup> Evidence is insufficient (as of May 2020) to know if there is a benefit for neuropathic pain,<sup>78,79</sup> neck pain,<sup>80</sup> obesity,<sup>81</sup> glaucoma,<sup>82</sup> polycystic ovarian syndrome (PCOS),<sup>83</sup> gastroparesis,<sup>84</sup> xerostomia (dry mouth),<sup>71</sup> general insomnia,<sup>85,86</sup> overactive bladder,<sup>87</sup> in vitro fertilization success,<sup>88</sup> or cardiovascular disease.<sup>89</sup> There is promise for acupuncture in treating PTSD, benign prostatic hyperplasia,<sup>90</sup> chronic prostatitis/chronic pelvic pain syndrome,<sup>91</sup> acute stroke, insulin resistance,<sup>92</sup> congestive heart failure,<sup>93</sup> chronic fatigue syndrome,<sup>94,95</sup> sleep disorders,<sup>96</sup> and stroke (rehabilitation), and tinnitus as well,<sup>97</sup> but more studies are needed.<sup>98</sup>

**Battlefield Acupuncture research.** In many recipients, BFA is reported to reduce pain for hours to months. A study of 112 Veterans who attended group clinics reported a decrease in various types of pain by 88% on post-treatment day 0; 81% at day 1; 52% at day 7; and 51% at post-treatment day 40.<sup>99</sup> A 2017 review noted that more research is needed before BFA can be

considered an evidence-based approach,<sup>100</sup> though a 2017 review of 10 studies found a small benefit and noted that adverse effects were “minor and transient.”<sup>101</sup>

## What to Watch Out for (Harms)

A 2017 overview of 17 systematic reviews noted that serious adverse events, such as deaths, infections, and local reactions are possible but rarely occur.<sup>102</sup> A 2014 review concluded that acupuncture appears to be safe in anticoagulated patients when done at the appropriate depth in the appropriate locations.<sup>103</sup> The 2014 review of reviews on acupuncture, referenced above, also looked at adverse effects.<sup>21</sup>

- In the “Pain” studies, 12 reviews addressed adverse events, and all of these were minor—for example, bruising, temporary pain, faintness, and discomfort. They were comparable to adverse effects for control groups.
- Of the “Mental Health” reviews, 6 addressed adverse events. Most studies found no or minimal events. Adverse events from acupuncture were lower in number than those for antidepressants (10.2% versus 40.4%).
- In reviews of acupuncture for overall “Wellness,” 13 reviews noted adverse events. Again, reporting rates were rare. There was one report of a patient dropping out of a study because of pain.

A search through four Chinese journals found 1,038 total adverse event case reports up through 2010. Of these, 35 were cases where fatalities resulted, primarily because acupuncture was performed by someone who was not appropriately trained. Overly aggressive needling in the chest cavity can potentially cause pneumothorax; a 2019 study of over 411,000 patients in Taiwan found that the rate of this was 0.87 per 100,000 treatments.<sup>104</sup> Risk increased for people with chronic bronchitis, emphysema, pneumonia, lung cancer, and tuberculosis. Poor sterile technique can lead to transmission of infection; in the U.S., nearly all practitioners use disposable needles, so this is less of a concern. In the U.S., hospital-related adverse events occur at a much higher rate.<sup>105</sup> Caution should also be used if someone is on blood-thinning medications or has uncontrolled seizures.

A 2012 review of all known complications related to acupuncture reported to the British National Health Service noted 325 incidents that met inclusion criteria. They concluded that “Adverse events reported include retained needles (31%), dizziness (30%), loss of consciousness/ becoming unresponsive (19%), falls (4%), bruising or soreness at needle site (2%), pneumothorax (1%), and other adverse reactions (12%). The majority (95%) of the incidents were categorized as low or no harm.”<sup>106</sup>

Because acupuncture has a relaxing effect, it is important that people be careful they are not too drowsy to operate machinery after treatment. Exercise discretion as far as tolerability in people with severe needle phobias or severe mental health concerns. As a side note, there are reports of imported herbal supplements from China, which may be used in association with acupuncture, being adulterated with toxic compounds.<sup>107</sup>

## Tips from Your Integrative Health Colleagues

Acupuncturists often say that how long one needs to receive acupuncture (i.e. the number of sessions) is proportional to time a person has had a disorder; that is, if a problem is chronic, it will take longer to respond to acupuncture. Many therapists will suggest one to three sessions a week for the first few weeks and then scale back. Acute issues may heal with just one session. A 2017 meta-analysis of 20 trials including nearly 6,400 chronic pain patients found that “...approximately 90% of the benefit of acupuncture relative to controls would be sustained at 12 months.”<sup>108</sup>

Chinese medicine takes an entirely different perspective on the origins of illness. When a complex person seemingly has multiple unrelated complaints/concerns from a Western perspective, it may be that acupuncture will actually have an explanatory model that can account for them all.

Researchers have called for more formal clinical practice guidelines, now that acupuncture has been gaining more of a foothold in conventional medical settings.<sup>109</sup>

## Resources

### WEB Resources

- [Evidence Map of Acupuncture:](https://www.hsrdr.research.va.gov/publications/esp/acupuncture.cfm)  
<https://www.hsrdr.research.va.gov/publications/esp/acupuncture.cfm>
  - Compilation of systematic review data by VA Health Services Research and Development (HSR&D)
- [Traditional Chinese Medicine: What You Need to Know.](https://www.nccih.nih.gov/health/traditional-chinese-medicine-what-you-need-to-know)  
<https://www.nccih.nih.gov/health/traditional-chinese-medicine-what-you-need-to-know>
  - National Center for Complementary and Integrative Health.
- [Qi Journal](https://www.qi-journal.com) of Traditional Eastern Health & Fitness. <https://www.qi-journal.com>
- [Yin-Yang House.](http://www.yinyanghouse.com/) <http://www.yinyanghouse.com/>
  - Introduction to Chinese medicine and has a comprehensive set of acupuncture meridian diagrams.

### Books

- *Acupressure's Potent Points: A Guide to Self-Care for Common Ailments*, Michael Gach (1990)
- *Between Heaven and Earth: A Guide to Chinese Medicine*, Harriet Beinfield (1992)
- *Chinese Self Massage Therapy: The Easy Way to Health*, Ya-Li Fan (1999)
- *The Web That Has No Weaver: Understanding Chinese Medicine*, Ted Kaptchuk (2000)
- *Voices of Qi*, Alex Holland (2000)

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