

# **Scientific evidence for the validity of veterinary acupuncture**

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## **Direct scientific research evidence supporting acupuncture as an effective treatment**

The US National Library of Medicine can be searched through PubMed at: <http://www.ncbi.nlm.nih.gov/pubmed/> to show the huge volume of scientific research that has now been done on acupuncture's basic mechanisms and clinical applications in both animals and humans. As of 25 February, 2010, a search on the keyword "acupuncture", limited only to papers with abstracts, results in 14,846 papers, which shows the depth of scientific research now published in English on acupuncture. I have a list (but I will post in the online library in the next future), in which 195 of these articles that relate to veterinary medicine specifically, and provide direct evidence to validate Chinese acupuncture's theories and effects, and show it to be a safe, effective treatment modality.

In 1997, the National Institutes of Health (NIH) published a consensus paper on acupuncture. This was the result of several days of expert scientific presentations and discussion by an independent group of professionals. In conclusion, this stated, "Acupuncture, as a therapeutic intervention, is widely practiced in the United States. While there have been many studies of its potential usefulness, many of these studies provide equivocal results because of design, sample size, and other factors. The issue is further complicated by inherent difficulties in the use of appropriate controls, such as placebos and sham acupuncture groups. However, promising results have emerged, for example, showing efficacy of acupuncture in adult postoperative and chemotherapy nausea and vomiting, and in postoperative dental pain. There are other situations such as addiction, stroke rehabilitation, headache, menstrual cramps, tennis elbow, fibromyalgia, myofascial pain, osteoarthritis, low back pain, carpal tunnel syndrome, and asthma, in which acupuncture may be useful as an adjunct treatment or an acceptable alternative or be included in a comprehensive management program. Further research is likely to uncover additional areas where acupuncture interventions will be useful" (LongLink@consensus.nih.gov).

In 2003, the World Health Organization (WHO) published a review of the scientific evidence for acupuncture treatment of numerous conditions. After analysis of clinical trials of acupuncture, the WHO concluded that acupuncture has proven effects in a large number of specific conditions in humans. The review listed 28 symptoms, diseases and conditions for which acupuncture has, "Been proved - through controlled trials - to be an effective treatment," including numerous types of pain, allergic rhinitis, nausea and vomiting, and elevated and decreased blood pressure. The review also listed a further 63 conditions for which, "The therapeutic effect of acupuncture has been shown, but for which further proof is needed" (WHO 2003).

The NIH and WHO are not the only professional, independent medical associations that have analyzed, and been convinced of the effectiveness of acupuncture. In 2007, the American Pain Society and the American College of Physicians issued joint clinical practice guidelines for diagnosis and treatment of low back pain. These stated that, "For patients who do not improve with self-care options, clinicians should consider the addition of non-pharmacologic therapy with proven benefits," and went on to recommend acupuncture for low back pain that is subacute or chronic (Chou *et al.* 2007).

These findings, by respected organizations, demonstrate how far acupuncture has come from its earliest beginnings. Since that time, a massive amount of data has been accumulated to advance, demonstrate and support acupuncture's clinical relevance and effectiveness.

It is not only clinical studies that provide scientific evidence for acupuncture's diagnostic and therapeutic practices. Further scientific evidence for acupuncture's genuine effects on the human and animal body come from magnetic resonance imaging (MRI) and positron emission tomography (PET) imaging studies.

In Traditional Chinese Medicine (TCM) theory, acupuncture points are associated with various internal organs and bodily functions. Imaging has been used to clearly demonstrate a direct relationship between stimulation of an acupuncture point and activity in areas of the brain related to the organ or function TCM theory associates with that acupuncture point. For example, if the acupuncture point ST-36 (on the stomach acupuncture meridian) is needled, PET scans show that this triggers activity in the nerve centers of the brain associated with gastric function (Yin *et al.* 2003). Stimulation of the acupuncture point PC-6 (pericardium 6), which has been proven to control nausea and vomiting, has been shown by MRI imaging to affect gastric myoelectrical activity, vagal modulation and cerebellar vestibular activity, all of which are involved in nausea and vomiting (Streitberger *et al.* 2006).

Another study looked at acupuncture channels and the internal organs that TCM theories associates them with. MRI contrast agent was injected into various acupuncture points, and migration of the contrast agent was monitored by MRI. The injected contrast agent's final distribution was found to correspond with the internal organ that the injected acupuncture point is associated with (Jungdae *et al.* 2009).

A variety of research studies have confirmed the efficacy of acupuncture in veterinary medicine. For example, 50 dogs of thoracolumbar intervertebral disk disease were randomly allocated to 1 of 2 treatment groups and classified as having grade 1 to 5 neurologic dysfunction. Dogs in group 1 received electroacupuncture stimulation combined with standard Western medical treatment; those in group 2 received only standard Western medical treatment. A numeric score for neurologic function was evaluated at 4 time points to evaluate effects of treatments. The results showed that Time (mean  $\pm$  SD) to recover ambulation in dogs with grade 3 and 4 dysfunction in group 1 (10.10  $\pm$  6.49 days) was significantly lower than in group 2 (20.83  $\pm$  11.99 days). Success (able to walk without assistance) rate for dogs with grade 3 and 4 dysfunction in group 1 (10/10 dogs) was significantly higher than that of similarly affected dogs in group 2 (6/9 dogs). Overall success rate (all dysfunction grades) for group 1 (23/26; 88.5%) was significantly higher than for group 2 (14/24; 58.3%). This research concluded that electroacupuncture combined with standard Western medical treatment was effective and resulted in shorter time to recover ambulation and deep pain perception, than did use of Western treatment alone in dogs with signs of thoracolumbar (Hayashi *et al.* 2007).

Another example of acupuncture in veterinary medicine is its application in equine reproduction. Research evidence has supported the physiologic basis for the use of acupuncture as a treatment in equine reproduction disorders including anestrus, urine pooling, infertility, and poor libido in stallions. The benefits achieved through acupuncture treatment are thought to be a result of hormonal regulation, altered smooth muscle motility, and general stress and/or pain relief from musculoskeletal or environmental conditions (Schofield 2008).

## **Acupuncture is part of the curriculum of DVM programs at AVMA-accredited veterinary medical schools**

Two-week Acupuncture Clinical Rotation (VEM 5876, elective) has been offered annually at the University of Florida College of Veterinary Medicine (UFCVM) since 2001. An average of 60 junior and senior veterinary professional students take this rotation annually. Eight interns have completed Acupuncture Internship Programs at UFCVM since 2004. UFVMC Acupuncture Service is open from Monday through Saturday with an average weekly caseload of 30 to 50 patients. The majority of the cases are in house referrals from other services at VMC or outside referrals from other veterinarians. Cases include oncology, dermatology, neurology, endocrinology, renal disorders, musculoskeletal, gastrointestinal, respiratory, cardiovascular, and behavioral issues.

Acupuncture is not only a part of the curriculum of the DVM program at the University of Florida, but also at other respected, AVMA-accredited veterinary schools across the US and around the world. Worldwide, the AVMA-accredited veterinary medical schools which teach acupuncture include: University of California Davis, University of Tennessee, Washington State University, Oklahoma State University, Murdoch University, and University of Minnesota.

## **NIH grants and other funding sources encourage and support research on acupuncture**

The National Center for Complementary and Alternative Medicine (NCCAM) is one of the 27 institutes and centers that make up the National Institutes of Health (NIH). NCCAM received approximately \$31 million from the American Recovery and Reinvestment Act (Recovery Act) to fund complementary and alternative medicine research in fiscal years 2009 and 2010. As of September 30, 2009, NCCAM has awarded \$16.8 million to fund 45 new and pending grant applications. \$2.48 million has already been allocated to projects specifically dedicated to the study of acupuncture's mechanisms and efficacy in a variety of disorders. In addition, the NIH Office of the Director funded four grants that NCCAM will administer for a total of \$1.4 million. Studies on chronic pain, one of the main targets of Recovery Act funding, are, "A vital component of NCCAM's research portfolio," and acupuncture is a key part of this (NCCAM 2011).

Other funding sources currently supporting acupuncture research include the Florida Pari-Mutual, Morris Animal Foundation (MAF) and the American Association of Equine Practitioners (AAEP). As a member of the faculty of the University of Florida College of Veterinary Medicine (UFCVM), I (Huisheng Xie) have been the Principal Investigator (PI) or Co-PI of seven grants to study the efficacy of acupuncture in horses and dogs over the past 10 years.

UFCVM's grant-funded acupuncture research projects include scientific studies of acupuncture's efficacy in the treatment of chronic thoracolumbar pain in horses, effects of acupuncture on pulmonary function in horses, efficacy of acupuncture in decreasing intraocular pressure in Rhesus Monkeys with chronic glaucoma, efficacy of acupuncture on experimentally induced colic in horses, assessment of quality of life after acupuncture treatment, and the influence and mechanism of action of acupuncture stimulation on pain thresholds in horses.

Results from UFCVM's scientific acupuncture research have been instrumental in defining both acupuncture's effects, and procedures for greatest efficacy in acupuncture's clinical application in veterinary medicine. For example, one research project demonstrated that electro-acupuncture (EA) treatments using high frequencies (80-120 Hz) induce a stronger local analgesic effect than

EA treatments using low frequencies (20Hz). However, EA treatments with lower frequencies induce analgesia, that although milder in its effect, persists longer (Xie *et al.* 2001). This research has therefore not only proved that EA has clinically useful analgesic effects, but also demonstrated how best it can be applied in clinical practice.

This research at UFCVM has also found that hoof withdrawal reflex latency (HWRL) can be a valid measurement to assess pain perception and acupuncture pain relief in horses. Interestingly enough, EA significantly increases HWRL and reduces the lameness score, while simultaneously increasing the plasma  $\beta$ -endorphin concentration. These results indicate that the release of  $\beta$ -endorphin may be the pathway through which acupuncture relieves pain. None of the acupuncture treatments altered the ACTH concentrations, which indicates that ACTH is not involved in EA analgesia (Xie *et al.* 2001).

Clinical trials using EA were conducted in performance horses suffering from chronic back pain. Results provided evidence that three sessions of EA treatment successfully relieves signs of back pain in horses, and the analgesic effect induced by EA can last at least two weeks. On the other hand, oral medication with phenylbutazone does not effectively relieve signs of back pain. These results were published in the Journal of American Veterinary Medical Association (Xie *et al.* 2005), and the American Journal of Traditional Chinese Veterinary Medicine (Xie *et al.* 2009).

Another example of scientific research into acupuncture producing clinically useful results is a study of the efficacy of acupuncture in glaucoma. A pilot study using electro-acupuncture to decrease intraocular pressure in Rhesus Monkeys with chronic glaucoma was funded by the University of Florida College of Veterinary Medicine 2005 Development Award. Twelve male Rhesus Monkeys, which had previously undergone argon laser photocoagulation of the trabecular meshwork in one eye (OD) to produce a sustained elevation in intraocular pressure (IOP), were studied. In the acupuncture treatment group, at one hour post-EA, the IOP of the glaucomatous eyes decreased to less than half the baseline pressure ( $41.1 \pm 8.3$  vs.  $20.9 \pm 3.3$  mmHg  $\pm$  SD,  $p < 0.05$ ). It remained considerably decreased at 24 hours ( $26.6 \pm 9.3$  mmHg) and 48 hours ( $27.9 \pm 3.8$  mmHg), and was not significantly different by 72 hours ( $32.6 \pm 7.1$  mmHg). The IOP of OD in the control group did not differ from baseline. These results were published in the Proceedings of the Association for Research in Vision and Ophthalmology (ARVO) Annual Conference (Cantwell *et al.* 2007). As glaucoma is the leading cause of irreversible blindness in people, this study may lead us to receive funding from the National Institutes of Health (NIH) to continue this research.

On-going acupuncture research projects include assessment and promotion of quality of life in geriatric patients. As companion animals' life spans increase, geriatric health care becomes a focus of veterinary practice. With geriatric patients, the primary goal is to promote their quality of life rather than cure their diseases. Several clinical trials have demonstrated that acupuncture and Chinese Medicine can help accomplish this goal. An assessment score system has been created to evaluate the quality of life in geriatric patients. Acupuncture clinicians have used this system to assess the quality of life and the results of acupuncture therapy in geriatric patients (Xie 2009).

## **The AVMA supports education in veterinary acupuncture**

As far back as 1996, the AVMA declared that, "Veterinary acupuncture and acuthery are now considered an integral part of veterinary medicine" (AVMA 1996), and the recent 2009 AVMA Convention included lectures on acupuncture (AVMA 2009). The latest AVMA Guidelines for Complementary and Alternative Veterinary Medicine (approved in 2001, revised in 2007) state that, "Recommendations for effective and safe care should be based on available scientific

knowledge,” and that, “Veterinarians should ensure that they have the requisite skills and knowledge for any treatment modality they may consider using” (AVMA 2007).

As demonstrated in (1) and (3) above, there is now great scientific knowledge about acupuncture’s efficacy and its most beneficial applications in animals. The safe and effective practice of acupuncture in animals requires extensive knowledge of animal physiology and pathology, as well as acupuncture itself. If the veterinary profession does not offer adequate, CE-approved training in acupuncture for veterinarians, lay people will fill the demand from the general public for this treatment for their animals. Without veterinary knowledge, lay people can unfortunately do more harm than good to animals. In order to comply with the AVMA’s latest guidelines concerning veterinarians’ training for the modalities they offer, it is essential that CE institutes exist to provide interested veterinarians with the necessary acupuncture skills and knowledge, so that animals in their care can receive the very best treatment.

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