**12/14/08 THESKEPTICARENA.COM**

**ACUPUNCTURE**

**Acupuncture is a traditional Chinese medical technique for unblocking chi (ch'i or qi) by inserting needles at particular points on the body to balance the opposing forces of yin and yang. Chi is an energy that allegedly permeates all things. It is believed to flow through the body along 12 main pathways called meridians. When yin and yang are in harmony, chi flows freely within the body and a person is healthy. When a person is sick, diseased, or injured, there is an obstruction of chi along one of the meridians. Traditional Chinese medicine has identified some 500 specific points where needles are to be inserted for specific effects.**

**Some practitioners believe that acupuncture has been practiced in China for more than 2,000 years. Some think it has been around for 4,000 years. However, the earliest medical texts from China date to the third century BCE and they make no mention of acupuncture; nor is acupuncture mentioned in the earliest accounts of Chinese medicine to reach the West in the 13th century (Hall 2008).**

**Today, the needles are twirled, heated, or even stimulated with weak electrical current, ultrasound, or certain wavelengths of light. Some use tuning forks over the acupoints. Others direct laser beams at them. Still others use magnetic BBs on patches applied to acupoints. But no matter how it is done, scientific research can never demonstrate that unblocking chi by acupuncture or any other means is effective against any disease because chi is defined as being undetectable by the methods of empirical science.**

**A variation of traditional acupuncture is called auriculotherapy or ear acupuncture. It is a method of diagnosis and treatment based on the unsubstantiated belief that the ear is the map of the bodily organs. For example, a problem with an organ such as the liver is to be treated by sticking a needle into a certain point on the ear that is supposed to be the corresponding point for that organ. (Similar notions about a part of the body being an organ map are held by those who practice iridology [the iris is the map of the body] and reflexology [the foot is the map of the body].) Staplepuncture, a variation of auriculotherapy, puts staples at key points on the ear hoping to do such things as help people stop smoking.**

**Traditional Chinese medicine is not based on knowledge of modern physiology, biochemistry, nutrition, anatomy, or any of the known mechanisms of healing. Nor is it based on knowledge of cell chemistry, blood circulation, nerve function, or the existence of hormones or other biochemical substances. There is no correlation between the meridians used in traditional Chinese medicine and the actual layout of the organs and nerves in the human body.**

**The National Council Against Health Fraud (NCAHF) claims that of the 46 medical journals published by the Chinese Medical Association, not one is devoted to acupuncture or other traditional Chinese medical practices. Nevertheless, it is estimated that somewhere between 10 and 15 million Americans spend approximately $500 million a year on acupuncture for treatment of AIDS, allergies, asthma, arthritis, bladder and kidney problems, bronchitis, constipation, depression, diarrhea, dizziness, colds, fatigue, flu, gynecologic disorders, headaches, high blood pressure, migraines, paralysis, PMS, sciatica, sexual dysfunction, smoking, stress, stroke, tendonitis, and vision problems.**

**Empirical studies on acupuncture are in their infancy. Such studies ignore notions based on metaphysics (such as unblocking chi along meridians) and seek to find causal connections between sticking needles into traditional (or nontraditional) acupuncture points and physical effects. Even so, many traditional doctors and hospitals are offering acupuncture as a "complementary" therapy based on the belief that acupuncture has a long history of satisfied customers.**

**The University of California at Los Angeles medical school has one of the largest acupuncture training courses in the United States for licensed physicians. The 200-hour program teaches nearly 600 physicians a year. According to the American Academy of Medical Acupuncture, about 4,000 U.S. physicians have training in acupuncture.**

**In March 1996, the Food and Drug Administration (FDA) classified acupuncture needles as medical devices for general use by trained professionals. Until then, acupuncture needles had been classified as Class III medical devices, meaning their safety and usefulness was so uncertain that they could be used only in approved research projects. Because of its "experimental" status, many insurance companies, as well as Medicare and Medicaid, had refused to cover acupuncture. This new designation has meant both more practice of acupuncture and more research being done using needles. It also means that insurance companies may not be able to avoid covering acupuncture treatments for a variety of ailments. Nevertheless, Wayne B. Jonas, director of the Office of Alternative Medicine at the National Institutes of Health in Bethesda, MD, has said that the reclassification of acupuncture needles is "a very wise and logical decision." The Office of Alternative Medicine is very supportive (i.e. willing to spend good amounts of tax dollars) on new studies of the effectiveness of acupuncture.**

**The most frequently offered defense of acupuncture by its defenders commits the pragmatic fallacy. It is argued that acupuncture works! The main problem with this defense is that a number of studies have shown beyond a reasonable doubt that sham acupuncture works just as well as acupuncture. What does this mean? It certainly does not mean that sticking needles into one's body opens up blocked chi. At most, it means that acupuncture and sham acupuncture relieve some medical burden. Most often it simply means that some customer is satisfied, that is, feels better at the moment.**

**The NCAHF issued a position paper on acupuncture that asserts: "Research during the past twenty years has failed to demonstrate that acupuncture is effective against any disease" and that "the perceived effects of acupuncture are probably due to a combination of expectation, suggestion, counter-irritation, operant conditioning, and other psychological mechanisms." In short, most of the perceived beneficial effects of acupuncture are probably due to mood change, the placebo effect, and the regressive fallacy. Just because the pain went away after the acupuncture doesn't mean the treatment was the cause. Much chronic pain comes and goes. An alternative treatment such as acupuncture is sought only when the pain is near its most severe level. Natural regression will lead to the pain becoming less once it has reached its maximum level of severity. Also, much of the support for acupuncture is anecdotal in the form of testimonial evidence from satisfied customers. Unfortunately, for every anecdote of someone whose pain was relieved by acupuncture there may well be another anecdote of someone whose pain was not relieved by acupuncture But nobody is keeping track of the failures (confirmation bias).**

**Nevertheless, it is possible that sticking needles into the body, or pretending to do so, may have some beneficial effects. The most common claim of success by acupuncture advocates is in the area of pain control. Studies have shown that many acupuncture points are more richly supplied with nerve endings than are the surrounding skin areas. Some research indicates sticking needles into certain points affects the nervous system and stimulates the body's production of natural painkilling chemicals such as endorphins and enkephalins, and triggers the release of certain neural hormones including serotonin. Another theory suggests that acupuncture blocks the transmission of pain impulses from parts of the body to the central nervous system. More likely, however, is that conditioning and expectation are the dominant factors in any opiod response.**

**Martina Amanzio et al. (2001) demonstrated that "at least part of the physiological basis for the placebo effect is opiod in nature" (Bausell 2007: 160). We can be conditioned to release such chemical substances as endorphins, catecholamines, cortisol, and adrenaline. One reason, therefore, that people report pain relief from both acupuncture and sham acupuncture is that both are placebos that stimulate the opiod system.**

**In any case, there are difficulties that face any study of pain. Not only is pain measurement entirely subjective, but traditional acupuncturists evaluate success of treatment almost entirely subjectively, relying on their own observations and reports from patients, rather than objective laboratory tests. Furthermore, many individuals who swear by acupuncture (or therapeutic touch, reiki, iridology, meditation, mineral supplements, etc.) often make several changes in their lives at once, thereby making it difficult to isolate significant causal factors in a control group study.**

**Despite these difficulties, researchers can use the Von Korff Chronic Pain Grade Scale questionnaire and the back-specific Hanover Functional Ability Questionnaire (for back pain studies) to measure changes in back pain after various kinds of treatment. For example, a randomized, blinded study involving over 1,100 subjects with chronic back pain were given different treatments and evaluated after six months using both the Von Korff and the Hanover instruments. The study compared treatment by (1) acupuncture using traditional acupuncture points and methods, (2) acupuncture that used non-traditional points and methods (the needles weren't inserted as deeply or twirled as in traditional acupuncture, and (3) treatment involving drugs, exercise, and physical therapy. About twice as many in the groups stuck with needles responded to the treatment as in the non-needle group. It did not matter whether they were stuck in traditional points using traditional methods or in non-standard points using non-traditional methods. About 45% responded in these groups compared to about 25% in the group treated with drugs, exercise, and physical therapy. According to the BBC:**

**The researchers, from the Ruhr University Bochum, say their findings suggest that the body may react positively to any thin needle prick - or that acupuncture may simply trigger a placebo effect.\***

**The results of this and another study done at Linköping University in Sweden, which found no significant difference in response from those getting so-called verum (or "true") acupuncture and so-called minimal (or "sham") acupuncture, provide evidence against the accuracy of the traditional Chinese meridians map. It doesn't seem to matter where you stick the needles, whether you stick them in deeply or twirl them, or whether you stick them in at all. The concept of chi seems superfluous in this context.**

**The Linköping study involved "215 patients with various types of cancer who got either active acupuncture or a sham treatment that involved an identical looking and feeling needle that retracted into the handle on contact with the skin."\* This method prevents the patients from knowing whether they've actually been stuck with a needle. The patients were given conventional radiotherapy during the trials. Many believers in acupuncture think it is effective in relieving nausea. Both the verum and the sham groups believed the treatment had been invasive and effective in reducing nausea: "68 percent of patients who got the acupuncture experienced nausea for an average of 19 days during radiotherapy and 61 percent of the patients who got the sham treatment suffered nausea for an average of 17 days....Vomiting was experienced by 24 percent of the patients getting acupuncture and 28 percent of patients receiving the sham treatment....Fifty-eight of the patients received chemotherapy in combination with radiotherapy. Among them, 82 percent of those in the acupuncture group developed nausea, compared with 80 percent of those treated with the sham needles....66 percent of patients who got acupuncture and 71 percent who got the sham treatment said they would be highly interested in having acupuncture again if it turned out they needed another course of radiotherapy." The differences between the two groups are not statistically significant. These results strongly suggest that acupuncture provides a placebo effect.**

**Some of the acupuncture studies supported by the Office of Alternative Medicine at the National Institutes of Health try to mimic traditional control group studies, but no control study will reveal if chi was unblocked or if yin and yang are in or out of harmony. In any case, many, if not most, of the studies by advocates of acupuncture suffer from having a small number of participants or lack of adequate controls for the placebo effect (Bausell 2007). Typical of these studies is one posted on the New Scientist website on December 20, 2007, with the headline:**

**Acupuncture relieves cancer chemotherapy fatigue**

**Chemotherapy wipes people out and any treatment that would provide a boost in energy would be welcome. If researchers were doing disinterested science, they would do a large study (at least 25 in each group), and it would be double-blinded, randomized, placebo-controlled, have a low attrition rate, and be published in a high-quality scientific journal. (See Bausell 2007: 104). The acupuncture study touted by New Scientist had 47 participants and three groups, and is described by the researchers as "a randomised placebo-controlled trial."**

**The patients were randomly assigned to one of three groups to receive either acupuncture or acupressure – placing physical pressure on acupuncture points with hands or objects – or sham acupressure.**

**The acupuncture group received six 20-minute sessions over a period of three weeks. The acupoints "were selected for their supposed propensity to boost energy levels and reduce fatigue." The acupressure group administered their own therapy. They were taught to massage the same acupoints for one minute a day for two weeks. The sham acupressure group also administered their own therapy, but were given different points to massage. One key ingredient for a placebo-controlled study seems missing: the administration of the therapy by the healer in the clinical setting for the two acupressure groups. Also, the way this study was conducted meant that compliance with the acupuncture group was known and likely to be high, whereas compliance with the acupressure groups would have to rely on self-reporting. In fact, even though this is a rather small study, one would predict—based on what we know about the placebo effect—that the difference in method of delivery of the treatment would lead to the acupuncture group reporting the best results. Another defect in the study is that the acupressure groups applied their therapy a minute a day for two weeks (28 minutes of self-treatment), while the acupuncture group received its therapy for three weeks (two 20-minute sessions per week, for a total of 120 minutes of therapy in a clinical setting). The difference in delivery of treatment by a healer in a clinical setting versus self-administration could account for any difference in effect, as could the difference in duration of the treatments.**

**The results were that "patients in the acupuncture group reported a 36% improvement in fatigue levels, whilst those in the acupressure group improved by 19%. Those in the sham acupressure group reported a 0.6% improvement." In other words, the results are what you would expect if acupuncture is a placebo. It worked better than acupressure because the patients had more reason to believe in the effectiveness of the therapy and more reason to expect good results.**

**The large difference between the two acupressure groups is interesting, however. It could be an artifact of the small size of the samples, of the dropout rate (not mentioned in the article), or of the way improvement was measured; or it could indicate that traditional trigger points of acupressure are more effective than non-trigger points. Whatever this study indicates, there is little justification for claiming that it indicates that acupuncture relieves cancer chemotherapy fatigue.**

**The study was published in the journal Complementary Therapies in Medicine (Volume 15, Issue 4, Pages 228-237). It's called "The management of cancer-related fatigue after chemotherapy with acupuncture and acupressure: A randomised controlled trial." It was done at Manchester’s Christie Hospital by Alexander Molassiotis et al. We await replication, but with larger samples and better controls for the placebo effect. In the meantime, I suggest that New Scientist rewrite the headline to read:**

**Biased acupuncture study published in second-tier peer-reviewed journal**

**Finally, acupuncture is not without risks. There have been some reports of lung and bladder punctures, some broken needles, and some allergic reactions to needles containing substances other than surgical steel. Acupuncture may be harmful to the fetus in early pregnancy since it may stimulate the production of adrenocorticotropic hormone (ACTH) and oxytocin, which affect labor. There is always the possibility of infection from unsterilized needles.\* And some patients will suffer simply because they avoided a known effective treatment of modern medicine.**

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**THE SCIENCE SEGMENT**

**9/16/08 Arctic Melting**

**WASHINGTON - Crucial Arctic sea ice this summer shrank to its second lowest level on record, scientists said Tuesday.**

**Sea ice hit its low on Friday, covering 1.74 million square miles of the Arctic, marking a low point for this summer. That's according to NASA and the National Snow and Ice Data Center in Boulder, Colo. Last summer it covered only 1.59 million square miles, the lowest since record-keeping began in 1979.**

**Arctic sea ice, which expands in winter and retreats in summer, is crucial to worldwide weather patterns and helps reflect heat. Scientists predict summer ice could disappear altogether within five to 10 years.**

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**THE ARENA GOES ABROAD**

**10/20/08**

**Taliban gunmen killed a Christian aid worker in Kabul today, and the militant group said it targeted the woman because she was spreading her religion. The dual South African-British national worked with handicapped Afghans and was shot by gunmen on a motorbike around 8 am, officials said. "This woman came to Afghanistan to teach Christianity to the people of Afghanistan," a militant spokesman said. "Our (leaders) issued a decree to kill this woman."**

**The woman's aid group SERVE—Serving Emergency Relief and Vocational Enterprises—identified her as Gayle Williams, 34, in a statement on its Web site. "She was a person who always loved the Afghans and was dedicated to serving those who are disabled," it said. A spokeswoman for SERVE in Kabul, said the group is a Christian organization "but they are definitely not expressing this on purpose. They are here to do NGO (aid) work."**

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**FAMOUS QUOTES**

**EVELYN FOX KELLER (1936-) age 72**

**She is an American physicist, author, and feminist and is currently a Professor of History and Philosophy of Science at the Massachusetts Institute of Technology. Keller has also taught at New York University and in the department of rhetoric at the University of California, Berkeley.**

**Keller received her B.A. in physics from Brandeis University in 1957 and continued her studies in theoretical physics at Harvard University graduating with a Ph.D. in 1963. She became interested in molecular biology during a visit to Cold Spring Harbor Laboratory while completing her Ph.D. dissertation. Her subsequent research has focused on the history and philosophy of modern biology and on gender and science.**

**"To know the history of science**

**is to recognize the mortality of any claim to universal truth."**