

# Acupuncture and the Treatment of Pain



**By: Jenny Crosby, DC**  
Crosby Chiropractic & Acupuncture Centre

In May of 2010, *Nature Neuroscience* published a study that linked a molecule called adenosine (aden·o·sine/ (ah·dende·sēn) to the pain-mediating effects of acupuncture. Performed at the University of Rochester Medical Center, the study involved 1) mice that genetically could not use adenosine, who showed no pain relief with

acupuncture 2) mice with normal levels of adenosine who had pain that was reduced by almost 66% and whose levels of adenosine rose almost 24 times over the pretreatment levels, and 3) mice on a leukemia medication known to increase the blood concentrations of adenosine, which tripled the beneficial effects of acupuncture on mice by relieving their pain for an additional two hours.

In September 2010, these findings were presented by Maiken Nedergaard, MD (who functions with the Departments of Neurology and Neurosurgery at the University of Rochester and who led the research) in Barcelona, Spain. Nedergaard was quoted as saying "Acupuncture has been a mainstay of medical treatment in certain parts of the world for 4,000 years, but because it has not been understood completely, many people have remained skeptical."

Adenosine is a purine nucleoside that is important in many biochemical processes such as energy transfer. With a half-life of only about 10 seconds, adenosine is negatively affected by caffeine, theophylline (found in some inhalers and in small doses in black and green tea), soy, St John's Wort and Valerian root. It's believed to have a role in promoting sleep and relaxation and it's known to have cardiac benefits (acting to dilate blood

vessels) and anti-inflammatory benefits. It's also a natural pain killer, becoming active in the skin after trauma to inhibit nerve signals and alleviate pain in much the same way as lidocaine does.

What the Rochester researchers found is that adenosine is also very active in deeper tissues that are treated with acupuncture needles. They looked at the effects of acupuncture on nerves called peripheral nerves (these are nerves that are not part of the brain or spinal cord).

There has been a large amount of research that shows acupuncture causes the brain to create two chemicals called endorphins and enkephalins which then act as natural pain killers. This research suggests that in addition to the pain-relieving effects of these two compounds, adenosine released at the needle site may also result in significant pain reduction.

The question of acupuncture's effectiveness of lack of effectiveness in different individuals may now have a scientific answer that those who perform acupuncture have learned to take into account.

The most common reason for not having a good response to acupuncture is the amount of caffeine consumption of a nonresponsive patient; from coffee, soda, tea or chocolate, or pain medications that contain caffeine.

Other reasons would be 1) the use of the chemical theophylline-based inhalers, and/or patients who consume large amounts of black and green tea which contain theophylline, 2) those who consume large amounts of soy, 3) the use of herbals such as St John's Wort and Valerian that can be detrimental to the func-

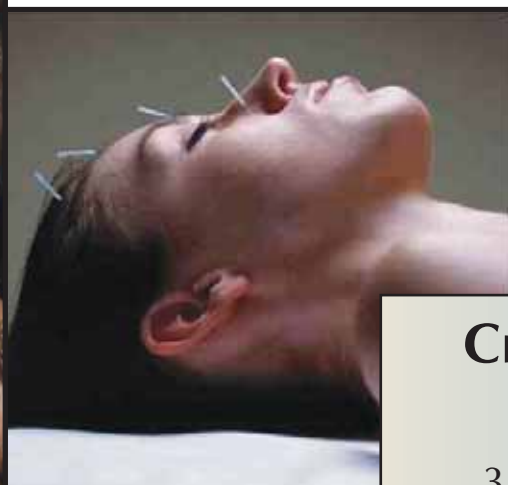
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tion of adenosine, 4) a lack of purines which come from protein in diet which are required for adenosine formation, perhaps due to a vegetarian diet or due to a gout diet. (Purines are found in high concentrations in organ meats such as liver and kidney. Moderate amounts of purines exist in beef, pork, poultry, fish and seafood, asparagus, cauliflower, spinach, mushrooms, green peas, lentils, dried peas, beans, oatmeal, wheat bran, wheat germ and hawthorn).

With this knowledge, should you want to get acupuncture and want it to be effective:

1. consume a form of protein before treatment
2. avoid caffeinated products of all kinds
3. avoid soy
4. drink large amounts of plain water to stay hydrated (and enable effective breakdown of adenosine-related compounds)
5. Know if your medicines are adenosine antagonists

It's great to see science finally catching up with 4000 years of clinical trial and observation. Maybe in another 100 years we will see strict scientific protocols that validate a healthier choice of food and beverage consumption as a means to get healthier faster.



## Crosby Chiropractic & Acupuncture Centre

331 Jungermann Rd. St Peters, MO 63376  
(636)928-5588  
www.crosbychiropractic.com