

Acupuncture science

In Acupuncture, we need two types of points: Local and Distal. Acupuncture increases the self-healing potential of the individual and treats the whole patient.

Acupuncture achieves its efficacy through a coordinated process that involves the four main body systems: the nervous system, cardiovascular system, endocrine system and immune system.

The efficacy of acupuncture depends on the self-healing potential of the patient and the healability of the symptoms. Acupuncture affects the nervous system, cardiovascular system, endocrine system and immune system. In this way, it restores homeostasis and activates self-healing potential which is different for every patient and influenced by genetic makeup, medical history, lifestyle and age.

Acupuncture points

Where there are sensory nerves (which is everywhere except hair and nails) there can be acu-points. Modern studies show that acupuncture efficacy does not always depend on the precise location of acu-points as indicated on meridian charts; but rather on a regional relationship that uses traditional mapping of acupuncture points to discover the unique location of an acu-point. This creates a specific treatment for that individual, offering a much more effective treatment.

Acu-points are always associated with a cutaneous nerve or muscular nerve. Those associated with larger nerve trunks and more likely to become tender than those with a smaller nerve trunk. More points are formed along the superficial nerve trunks than the deeper one. Where the trunks emerge closer to the surface of the skin, more acu-points form. Thus, there are more acu-points below the elbows and knees. That is why we examine those areas carefully. Acu-points below knees and elbows occupy a larger area in the cortical representation of the sensory gyrus in the brain. Needling these points can produce a greater reaction and activity in the brain. Acu-points are not discrete static points. They are dynamically changing structures. Some points remain tender whereas some become less tender or not at all tender.

Pain management with acupuncture

There are different types of muscular pain: acute mechanical injury; repetitive motion, and referred pain from a diseased joint or another injured area of the body. The nerve endings release pain mediators such as substance P, somatostatin and other peptides which influence neuronal excitability, microcirculation and metabolism. Substance P causes the release of histamine which increases inflammation (histamine release also causes hives). All of these sensitize nerve endings to pain and decrease the pain threshold.

When pain receptors are sensitized their firing threshold decreases. Under such physiological alteration, any slight stimulation such as light pressure may cause nerve ending to fire impulses to the CNS. If the

sensitization continues, it may further decrease the firing threshold of the pain receptors and the excited pain receptors may spontaneously discharge impulses to the CNS causing sensation of pain. This is known as NEUROGENIC pain and becomes a difficult issue to treat.

Chronic pain is not prolonged acute pain. The pain mechanisms involved are different. Acute pain is the warning signal of tissue injury and is locally restricted. Chronic pain itself is a disease that sensitizes both the tissues of the peripheral structures and the neurons of the spinal cord.

There is a well known theory called the Gate Control Theory of Pain: The spinal cord functions like a gate which can be opened or closed to incoming pain signals. Pain signals from fine nerve fibers C and A-delta are controlled and modified in the spinal cord by signals from large nerve fibers A-beta, before the signals reach the brain. For example, if you injure your finger, and then rub it, the nerves stimulated by rubbing arrive to the brain more quickly producing a dull pain sensation and diminish the sharp pain sensation. That is, the low threshold A-beta fibers are activated, travel faster, and block the fine C and A-delta fibers.

Acupuncture needling

Acupuncture needles directly stimulate and activate the dendrite receptors of the sensory neurons in the skin, muscles and other soft tissues. Needles make lesions in the soft tissues and locally activate neuroendocrine, immune and cardiovascular reactions around the needling sites in the painful tissues. These needling reactions directly desensitize the painful nerves and repair the damaged soft tissues.

The brain and spinal cord actively react to acupuncture. It stimulates sensory and sympathetic nerves (which control blood vessels, smooth muscles in the heart, organs, and glands) and motor neurons.

Acupuncture activates and balances the sympathetic and parasympathetic nervous systems. It is the same as the Taoist concept of Yin-passivity, and Yang--activity. The functional goal of a two part nervous system is to balance the visceral activities. The sympathetic increases adrenaline and blood sugar, regulates body temperature, and maintains contractibility of blood vessels. It is important in the "flight or fight" response. It is also energy consuming. Interestingly, the sympathetic reaction inhibits pain sensation (some soldiers don't experience pain after being injured on the battlefield.) If over activated, we become exhausted because of consumed stored energy. Our immune system gets stressed, and we can get sick. Homeostasis declines.

During rest and tranquility, the parasympathetic system becomes active. It allows proper food digestion which helps to absorb and supply energy flow to the body systems. Respirations slow down and blood flow is directed towards the internal organs instead of primarily to the muscles. Clinical evidence shows acupuncture stimulation normalizes the activities of the sympathetic and parasympathetic systems to restore optimal homeostasis which means it calms the sympathetic and activates parasympathetic.

There are systemic chain reactions of needling: Cutaneous microcirculation increases, there is

interaction between the needle shaft and connective tissues; local relaxation of the muscles improves blood circulation; central nervous system- mediated neuroendocrine activity increases; there are immune responses with the local release of mast cells; and there is the regeneration of fresh tissue.

Acupuncture relaxes the skeletal muscles, stimulates the spinal cord and causes the brain to secrete neurobiochemicals such as endorphins and serotonin which relax the smooth, cardiac and skeletal muscles. It gives the patient a sense of well-being. This effect explains why it can bring temporary relief from tension of blood vessels as in hypertension and can help asthma, by relaxing the bronchial smooth muscles. Because of the central nervous system affects of acupuncture on the spinal cord and brain, it can indirectly help visceral (organ) pain and nausea.

Da Qi or needling sensation

Commonly, one feels one of many needling sensations known as De Qi. (Deh Chee in TCM-traditional Chinese Medicine) These non-painful sensations mean that energy flow has been obtained or arrived. 90% needling will produce some sort of De Qi. It depends on fibers encountered, tissue perfusion and inflammation. Some of the sensations are brief electric shock running up and down a limb, a deep ache, soreness, or heaviness. Sometimes these sensations can last up 1-2 days. De Qi elicited by needle manipulation increases the effectiveness of muscle relaxation and pain relief. Manipulation may desensitize sensory receptors and restore normal pain thresholds.

Nervous System Effects

There are two sets of nerves:

1. Afferent nerves - transmit the information of sensation TO the CNS. (can be pain, heat or vibration)
2. Efferent nerves - Coming FROM the CNS: motor nerves (muscle contraction) secretory nerves (release of hormones)

Needles interfere with afferent (sensory) fibers. They work on efferent somatic (motor) fibers which innervate muscles to relax them. They also work on the visceral sympathetic and parasympathetic to restore homeostasis.

Muscle Energy Crisis

Nerves to muscle signal an action potential in the membrane of the muscle, resulting in a release of calcium which triggers contraction and shortening of muscle. If no further impulses are received, the SR (sarcoplasmic reticulum) reuptakes calcium and muscle relaxes.

When a muscle is injured, the SR is unable to reuptake the cytoplasmic calcium and the persistent high concentration of calcium prevents the decoupling of the two contractile proteins, actin and myosin, thus

not allowing the muscle to relax.

Lack of circulation and this energy consuming process creates tender muscle bands and acu-points and can lead to contracture. Needling relaxes contraction, and blood circulation improves. It breaks the vicious cycle of energy crises which result in trigger points in the muscle.

Endorphins and Monoamines and Electrical Stimulation

Transcutaneous electrical muscle stimulation is complementary to acupuncture in some cases. You can get a rhythmic physical vibration in the muscles, which relaxes them and improves circulation.

Acupuncture with and without electrical stimulation can release 4 types endorphins: beta-endorphin, enkephalin, dynorphin, and endomorphin. They are all fully released at different frequencies (Hz) of electrical stimulation, which in our case is interferential current (IFC.) Antiendorphins can be produced as a feedback mechanism which can negate the positive effect of endorphins. This can occur with 3+ hours of electric stimulation.

The midbrain monoamines serotonin and norepinephrine are released and play a role in electrical stimulation. They can give a sense of well-being as these are neurotransmitters also modified with certain anti-depressants.