

**Microcurrent:  
Past, Present, and Future**

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### **Introduction**

In my studies at Logan College of Chiropractic, I have seen, heard, and read about many incredible ways to help patients recover from injuries, remove pain, increase range of motion, and generally improve their overall state of health. I have been at times overwhelmed by the sheer amount of information that has been presented to me as a chiropractic student. There are so many different ways to treat patients that it can be difficult to decide not only which are the most cost-effective (for both the doctor and the patient), but, more importantly, which techniques or modalities (or combinations thereof) will offer the most help for the most patients. Microcurrent has been presented to me as a modality that is not only cost effective but also effectual for numerous patient conditions. In this literature review we will be looking at a description of microcurrent, how it is currently being used, where it came from, and what kind of potential it has for future use.

## Definition

What exactly is microcurrent? "Any electrical device that produces less than 1 milliampere can technically be called microcurrent, regardless of any other factors" according to Dr. Thomas Wing, a pioneer in microcurrent development (1). That, of course, is the bare minimum necessary for a device to get away with being called microcurrent. His statement implies that there are different kinds of microcurrent. In doing my research, I have found that this truly is the case - there are various kinds of microcurrent. Dr. Daniel Kirsch, another veteran in the field, concurs, saying, "not all brands of microcurrent are equally efficacious" (2). He further cautions users of microcurrent products to "check the manufacturer's specific instructions before using" (2). What do all these different types of microcurrent have in common? They all use a low volt, pulsed, microamp current (3). The pulse lasts about half a second, which is 2500 times longer than a typical TENS unit pulse (4). The current used is insufficient to depolarize nerves and is therefore subsensory (3). This current closely mimics the body's own bioelectrical currents (3). They all can be administered through hand held probes (sometimes pads are used), and treatment time averages less than a minute (longer for pads), depending upon the protocol (4). Dr. Dennis Greenlee, Dr. Wing's son-in-law, wrote an interesting article which takes the time to describe all the parts of a typical microcurrent machine:

Meter - usually either a needle type or digital readout. It indicates the percentage of current that the body is accepting in the treated area.

Channels - either one or two sets. Those with two are capable of providing two different frequencies to an area (interferential), or to treat two areas with the same frequency at the same time, such as treating the lymphatics while you're treating an area of pain and injury. When there is only one channel, all the microcurrent procedures except interferential can be performed.

Pad output - positive and negative. This provides a direct current flow from the positive to the negative and vice versa. This is also available with the probes.

Polarity - positive, negative and bipolar (permits unidirectional flow or biphasic). The current which the machines produce is basically biphasic, which means that it flows first from negative to positive, then positive to negative. This permits the tissue to choose the polarity it prefers. According to Becker, negative current has been shown to have value in regeneration. It is used in wound healing. Researchers say it kills bacteria. Positive current is useful in the area of swelling and blood stagnation.

Wave slope - controls the rate of current use. This is important when treating acute or chronic conditions.

Frequency - the number of cycles per second, also called Hertz. Frequency settings are from .3 to 999 Hz. I (Greenlee) believe the secret to success lies in the choice of frequency used. Frequency settings determine analgesia responses. In the ear, frequency is what allows the commands which produce an effect on the hormones. Each tissue seems to have a specific frequency that it responds to. It is frequency that makes electrical stimulation more efficient than stimulation by needle in both auricular and hand acupuncture.

Current - regulates level of current from  $10\mu\text{a}$  to  $600\mu\text{a}$ . Current affects the strength and depth of the stimulation. This is important in treating pain, for it controls the endorphin response.

Timer - regulates length of treatment. It permits you to control each treatment cycle, and also helps you keep on schedule. Treatments may be timed for a few seconds (as in treating body or acupoints with probes), or for minutes, hours or continuous use with pads.

Search - provides reading of electrical conductance. Some units have a search mode which allows you to search with a positive or

negative current. There are some procedures in which a positive search is preferred, such as acupuncture by Voll, but most searching is done with the negative mode. Negative requires less voltage to overcome skin resistance. Therefore the point tested is not being treated during testing and can be rechecked following the procedure.

This is important when doing meridian balance evaluation. (5)

### **Capabilities**

Within Dr. Greenlee's above description of a generic microcurrent machine lay various indications as to what microcurrent can do. The list is short but impressive in the older studies and more recently, the list has grown longer and has become even more impressive. According to Dr. Wallace and others, the primary use of microcurrent is to provide pain relief for both acute and chronic conditions (3). It can also be used for reduction of swelling, to improve range of motion, strength, and proprioception, as well as for healing of various injured tissues (3). Dr. Kirsch notes that there are "specific problems that it helps exceptionally well . . . such as sprains and pains from acute injuries or post-surgical trauma" (4). He continues:

Microcurrent electrical therapy is also extremely effective for headaches, temporomandibular joint disorder, neuropathies, arthritis, bursitis and tendonitis. Other areas where it is useful as an adjunctive therapy are ear aches, sore throats, toothaches, sinus

congestion, viral or allergic conjunctivitis, postherpetic neuralgia, skin ulcers, post-CVA spasticity, and compressive neuropathies, such as carpal tunnel syndrome. (4)

Dr. Greenlee and his wife, Carolyn Wing Greenlee, have been using and teaching seminars about her father's brand of microcurrent for more than twenty years now (6). They have found that combining microcurrent with acupuncture protocol produces even more amazing results than by using needles alone (5).

Dr. Terry Oleson uses microcurrent to treat everything from addictions to internal organs (musculoskeletal problems, too) via auricular therapy protocols (7).

Curious about contraindications? There are only two conditions in which microcurrent should be avoided - pregnancy and with demand type pacemakers (9). Other than these, there are "no known contraindications or significant adverse side effects to microcurrent therapy" (9). In short, microcurrent has a vast potential for healing many different kinds of conditions, with very little possibility of detrimental effects to the patient.

### **Development**

Now that we know a little bit about the modality and its capabilities, let us look at how microcurrent came into being. Generally when new technology arises, there is more than one person or group working toward optimizing that particular technology. For example - IBM and Apple - both make computers, but each company has gone about it in their own unique way. This is how it was with

microcurrent - more than one person was developing the technology, but due to the constraints of this review, I only have room to include the development of one brand of microcurrent. With respect to that fact, I have decided to focus primarily on the model developed by Dr. Thomas W. Wing, who is recognized as the "Father of Modern Microcurrent"(1). The model invented by Dr. Wing is known commonly as M.E.N.S. He had originally meant the initials to stand for "minimal electrical non-invasive stimulation" (9). It has now evolved to "microcurrent electrical neuromuscular stimulation" (3, 9). Either way, it is still "M.E.N.S." (M.E.N.S. is a registered trademark of Monad Corporation (6).)

Dr. Wing's chiropractic career was launched in 1941, after graduation from Southern California Chiropractic College (later merged with LACC). In 1952, he learned about electronic manufacturing. During that time, he also invented the first successful one-way radio paging device (beepers) which he sold to Litton Industries in 1954 (1, 9). Dr. Wing (a fourth generation physician) was trained by his father and uncle in Traditional Chinese Medicine and acupuncture before it had blossomed into popularity due to Nixon's 1972 visit to China (9). At that time, Dr. Wing participated in an Applied Kinesiology study group in which the research being done had begun to "show a parallel with acupuncture theory" (9). The group's leader, Dr. George Goodheart, as well as other research members asked and insisted that Dr. Wing apply his electronic expertise to design a "safer, better acupuncture instrument" to further the group's research (1). The state of electric



acupuncture instruments was, at the time, very simple (“a battery, a meter, a set of probes, and a fancy cabinet”) and the possibility of burning the patients with the direct current was very real (9). So, in 1973, Dr. Wing designed the first Accu-O-Matic which provided “the world’s first automated readout of meridians” (9). The device was well-received by his fellow chiropractors, leading to the “formation of the O-Matic Corporation in 1974 to manufacture and develop an improved model” (9). Research continued until 1978, when the United States Government “rescinded its temporary order to allow acupuncture devices to be marketed” (9). Working with the FDA, Dr. Wing changed a few things and the new My-O-Matic 1 won approval as a “microcurrent muscle stimulator” (1). One of the things that he changed was the wave form emitted by the device. Dr. Wing states the following in a 1997 article: “The new microcurrent electrotherapy revolution is due to a specific type of microcurrent that was invented and patented by a chiropractor”(1). That chiropractor was Dr. Wing, himself. And Dr. Wing has continued his research, utilizing current microprocessor technology to improve his invention. He also has adapted M.E.N.S. microcurrent to interferential principles (as mentioned by Dr. Greenlee in his machine description), opening up brand new areas of research (1). What makes Dr. Wing’s brand of microcurrent different is the special kind of wave called the “electronically simulated tidal wave” (3), otherwise known as the Tsunami wave (1). Dr. Wing explains it in his own words:

It is not just microcurrent, but an electronically synthesized wave designed to simulate the most powerful wave in nature, the tidal wave the Japanese call Tsunami. I called my patented wave form *Tsunami Wave* in honor of its powerful effect. Rather than alternating negative/positive, negative/positive, the Tsunami Wave continues in one polarity for 2-1/2 seconds before switching to the other polarity (on biphasic). This allows the power to build up and up, to break through without using a lot of current, then reverse for a push-pull effect. (1)

### **Bioelectricity**

The next obvious question is this: Upon what bodily system is the Tsunami Wave having a push-pull effect? It is, of course, the body's own electrical system. As chiropractors, we are taught all about how the nerves send impulses throughout the body via electrical changes in the polarity of its cells. The currents are produced by an electrochemical gradient inherent in the living cell (10). When these cells are injured, there is a disruption of the cell's normal current. This has been documented by various researchers, but perhaps the most popularly known is Robert O. Becker, who wrote The Body Electric in 1985 (11). A good description of the process of disruption is given by Dr. Dan Kirsch in 1996:

Initially the injured site has a much higher resistance than that of the surrounding tissue. Basic physics dictates that electricity tends towards the path of least resistance. Therefore, endogenous bioelectricity avoids areas of high resistance and takes the easiest path, generally around the injury. The decreased electrical flow through the injured area decreases the cellular capacitance. As a result, healing is impaired. This may be one of the reasons for inflammatory reactions. Pain, heat, swelling, and redness are the characteristics of inflamed tissues. Electricity flows more readily through hot fluids (4).

Microcurrent, being on the same level as the body's endogenous current (and applied correctly) is able to overcome the injury site's higher resistance and allow the site to "regain its capacitance" and reestablish homeostasis (4). One of the ways microcurrent has been found to enhance cellular healing is by increasing the level of adenosine triphosphate (ATP) in cells (4, 12). The study, referred to by both Dr. Kirsch and Dr. R. I. Picker, was performed at the University of Louvain, Belgium in 1982, by Cheng et al. (12). What they found was that micro amperage stimulation increased the level of tissue ATP by about 500 percent and both membrane transport and protein synthesis increased by 30 to 50 percent (4, 12). So? ATP is the main fuel for cells - one can confirm this fact by looking at any basic biochemistry text. With an increase of ATP the cell is

able to heal itself with dexterity because it has all the fuel it needs to accomplish the task at hand. There was another finding of interest in the aforementioned study: When the stimulation was increased from micro amperage to milliamperage, the levels of ATP, membrane transport, and protein synthesis were all decreased to a level *below* that at which they began (12). These findings support a hypothesis called the "Arndt-Schulz Law" which states: "Weak stimuli increase physiological activity and very strong stimuli inhibit or abolish activity" (13). In layman's terms - we have been "shouting" at the body when we should be "whispering." Now we can tell all parents why yelling at their kids doesn't work - it starts at the cellular level!

### Future

In 1990, when Mr. Wallace published his four volume study on M.E.N.S. microcurrent, he requested that more studies be done, comparing microcurrent to a placebo and to other modalities (3). Other researchers have complied with that request and some of their studies have been listed in an update by Dr. Wing (14). These studies compare microcurrent in a favorable light with respect to traditional modalities. The following table is excerpted from the article (14):

Approach	Average No. of Treatments Before Back to Work
Traditional physical therapy (Hot and cold packs, ultrasound, massage, etc.)	20.7
M.E.N.S. Microcurrent alone	8.7

Approach	Average No. of Treatments Before Back to Work
M.E.N.S. Microcurrent plus Medications	8.6

These studies and more like them are going on in various chiropractic offices, medical offices, therapy establishments, pain clinics, and professional locker rooms. With all that cooperation, we will soon see more information on what kind of frequencies are best for what injuries, as well as proper duration of treatment times. There are also studies being done on management of cancer growth and pain as well as continuing research on healing non-union fractures (4). Who knows what new application someone will dream up next?

### **Conclusion**

In reading and digesting all the material for this review, I have come to the conclusion that not only is microcurrent an impressive tool for healing, it is also cost-effective in many arenas as it cuts down considerably on recovery time for the patient. The other item that impressed me was how well microcurrent fits in with chiropractic philosophy. We adjust the human body to allow it to heal itself. We look to fix the cause of the problems, not to chase symptoms. Microcurrent therapy goes to the very root of our bodies' biology, to promote healing in the cells wherein the problems lie. You can't get much closer to the cause than that!

So am I going to use microcurrent in my practice? How can I not? This technology has helped so many patients in so many other offices with such great results that I would feel negligent if I didn't offer it in my own office. And with recent advances in technology, the devices are getting smaller and more affordable (have to keep that overhead down!). For those who are interested in finding more information, you may contact MONAD Corporation (California) at (800) 34-MONAD, or contact Earthen Vessel Productions on the Internet at [www.earthen.com](http://www.earthen.com).

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