

Original Paper

## Battlefield Acupuncture: Update

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### UPDATE OF THE BATTLEFIELD ACUPUNCTURE AURICULO TECHNIQUE

The update to the “Battlefield Acupuncture”<sup>1</sup> technique, as recommended by Niemtow, consists of first following the original protocol to determine the dominant ear. If—during this process—a single gold ASP needle (Sedatelac, Chemin des Muriers, F-68540, Irigny, France; obtainable from [www.omsmedical.com](http://www.omsmedical.com)) reduces the pain several points down on the pain scale, then a silver or stainless steel ASP needle may be placed just touching the gold ASP needle to achieve an even more substantial pain reduction. Niemtow does not recommend doubling up on the gold ASP needles if there is no pain attenuation. In the course of future description of acupoints associated with this technique, Burns suggests the use of “zone” to replace acupoint; i.e., Cingulate Gyrus zone. The rationale is that the exact point may not be exactly determinable even with an electronic point finder.

**Key Words:** Acupuncture, Battlefield, Pain, Auriculoacupuncture, Near Infrared Spectroscopy, Dissimilar Metal Needles

### INTRODUCTION

**I**N A PREVIOUS EDITION OF *Medical Acupuncture*,<sup>1</sup> Niemtow published a paper dealing with the basic principles of Battlefield Acupuncture that were developed in 2001. This auriculotherapy technique produces a significant attenuation of pain when tiny gold ASP needles (Sedatelac, Chemin des Muriers, F-68540 Irigny, France) are inserted into specific points in the ear following a prescribed sequence: Cingulate Gyrus, Thalamus, Omega 2, Shenmen, and Point Zero. The reader was also instructed how to determine the dominant ear that plays a substantial role in this process. The question is asked whether this technique may be improved upon? The answer is “yes.” Therefore, Niemtow recommends this upgrade to the “Battlefield Acupuncture,”

which has already achieved noteworthy pain relief in our Acupuncture Clinic, Malcolm Grow Medical Center, Andrews Air Force Base, MD.

### ELECTROPHYSIOLOGICAL PROPERTIES OF DISSIMILAR METALS

If substantial pain relief is experienced from 1 particular ASP gold needle during the sequence of needle placement, it stands to reason that a second needle, placed just touching the already-inserted needle, may further reduce pain. This is simple enough; namely, 2 gold needles almost in the same auriculo-zone, i.e., 2 needles in the Cingulate Gyrus zone or other “Battlefield” zones. Nevertheless,

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**FIG. 1.** Arrow delineates 1 gold and 1 stainless steel ASP needle just touching each other at the Cingulate Gyrus Zone.

Niemtzow postulates from observations that the addition of a second ASP needle of a *dissimilar* metal (stainless steel or silver) just touching the gold ASP needle will produce a small ionic current flow. This system may act like a micro-electrical stimulator to the “acu-zone” (Figure 1).

Let us examine this 2 needle system in terms of its electronic kinetics. When 2 different metals are in contact and are subjected to a conductive environment, there is a current flow between them. In 1780, Luigi Galvani discovered that when 2 different metals (brass and steel, for example) were connected together and both touched simulator to different parts of the nerve that enervates a frog leg that causes the leg muscle to contract. He called this “animal electricity.” This led to the development of the Voltaic pile by Alessandro Volta in the 1800s.<sup>2</sup>

By inserting both a gold ASP needle and a second stainless steel or silver ASP needle, just touching, we have the presence of 2 *dissimilar* metals in an electrolytic milieu that is the normal salty moisture released by our skin known as perspiration. Perspiration is the production of a fluid, consisting primarily of water as well as various dissolved solids (chiefly chlorides), that are excreted by the sweat glands in the skin. Its contents are very small amounts of lactate, urea, sodium, potassium, calcium, and magnesium. Trace elements such as zinc, copper, iron, chromium, nickel, and lead may be found. Sweat also contains the chemicals or odorants 2-methylphenol (o-cresol) and 4 methylphenol (p-cresol).<sup>3</sup>

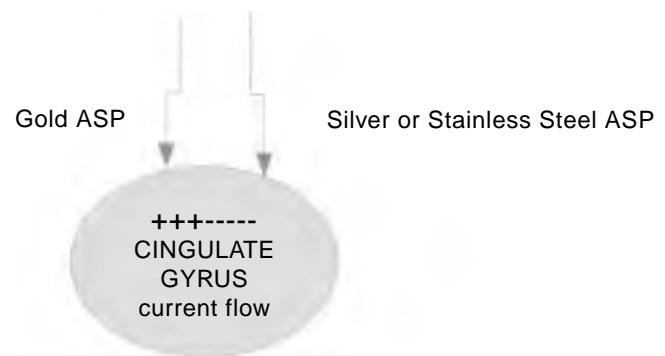
### Theoretical Electroproperties of *Dissimilar* ASP Needles In Vivo

It is theoretically possible that 2 different ASP metal needles will produce an electron current flow. The proposed mechanism is the following. A galvanic coupling occurs be-

tween the 2 metal needles in electrical contact. The metals are exposed to an electrolyte solution. A chemical reaction occurs at each of the needles. One of the needles becomes a cathode and the other an anode. The cathode consumes electrons and the anode takes up electrons. The ions in the electrolyte solution move to neutralize these charges at the cathode (electron cloud) and the anode (positive cloud). Electrons flow in the acupuncture area and the current flow may be as small as  $10^{-9}$  amperes.<sup>4</sup> Thus, the needles are interacting with their environment and a small electrical stimulation is occurring (Figure 2).

### First Measurements Using Electrical Stimulation of Battlefield Acupoints

To demonstrate for the first time that an electrical stimulation of battlefield acupuncture zones does influence brain function, we performed the following measurements: Itra-thin permanent needles were applied to the battlefield acupoints. Two generators located behind the ear produced electrical stimulation impulses which were transferred via the needles to the Battlefield Acupuncture zones on 1 ear. The wires were connected to the needles by snapping conductive plastic rings over the needles (Figure. 3). Electrical stimulation (P-Stim, Biegler GmbH, Mauerbach, Austria) was performed using a constant AC current of 1 mA; impulse duration was 1 ms, the impulse interval was 1000 ms, stimulus frequency was 1 Hz.<sup>5</sup> Figure 3 depicts the method (left) and the results of near-infrared spectroscopic (NIRS) measurements (NIRO 300, Hamamatsu Photonics, Hamamatsu, Japan). This instrument determined the regional cerebral oxygenation in the frontal areas of the brain. NIRS initially demonstrated a minor decrease in O<sub>2</sub>Hb (oxyhemoglobin) in a 35-year-old healthy volunteer during the first steady-state phase. During repetitive stimulation (“STIM”, Figure 3) an obvious increase in O<sub>2</sub>Hb and also in the tissue hemoglobin index was registered in this volunteer. The effect could be reproduced 3 times.



**FIG. 2.** Simulation of 2 ASP Needles of Dissimilar Metals Producing a Small Electrical Current.

## Electrical Stimulation of Battlefield - Acupoints



**FIG. 3.** Near-infrared spectroscopic measurements during electrical stimulation of battlefield acupuncture points in a 35-year-old female volunteer. Observe the reproducible increase in oxyhemoglobin ( $O_2Hb$ ) during electrical stimulation with a frequency of 1 Hz cHb indicates total hemoglobin; HHb, deoxyhemoglobin; THI, tissue hemoglobin index; TOI, tissue oxygenation index.

### DISCUSSION

The NIRS results shown in this paper underline the importance of the brain in acupuncture. The effects of acupuncture in the brain are measurable and reproducible. It appears by unknown mechanisms that the changes in cerebral oxygen metabolism may be demonstrated by auriculotherapy.<sup>8</sup>

Some acupuncturists assert that needles made from silver or gold have special therapeutic properties. In the experience of other clinicians, needles made from stainless steel are as effective in therapy as needles made from any other material. From the scientific point of view, it is almost impossible to prove or disprove any of the theories mentioned above. However, it is a fact that needles made from different metals can act as a kind of thermocouple and generate a small electric current.

Bioelectric phenomena can be found in every organ system in the human body. These phenomena are always associated with the distribution of ions or charged molecules in a biological structure, and the changes in this distribution result from specific processes. The resulting signals may be high/low frequency, steady-state or slowly modulating, and are important in cellular metabolism.<sup>6</sup>

The interaction between a metal needle in contact with an ionic solution produces a local change in the concentration of the ions in the tissue near the metal surface. Thus, a

potential difference is established between the metal needle and the electrolyte solution. It is well-known that different characteristic potentials occur for different materials.<sup>7</sup>

The difference between the potential at zero current and the measured potentials while current is passing is known as the overvoltage and is the result of an alteration in the charge distribution in the solution in contact with the needles or the ion-selective membrane. This effect is known as polarization. Non-polarized stimulation needles allow the current to pass freely across the electrode-electrolyte interface without changing the charge distribution in the electrolytic solution adjacent to the electrode.<sup>7</sup>

Needles made from noble metals, such as platinum, are often highly polarizable. A charge distribution different from that of the electrolyte solution is found in the tissue close to the needle surface. If the needles move (due to muscle contractions or mechanical tissue rejecting the needle) with respect to the electrolytic solution, the charge distribution in the solution adjacent to the needle surface will change and this will induce a voltage change in the needle.

Electrical stimulation and recording electric signals involves interacting with these ionic charge carriers and transducing ionic currents into electric currents by wires and electronic equipment. The authors have not detected whether electrolytes exist around the ASP needles and have not measured the current flow; therefore, it is a statement of con-

ture to critique the concept of this publication. However, we have demonstrated for the first time that electric stimulation of the Battlefield Acupuncture points using an electric current, (1 mA), a million-fold ( $10^6$ ) higher than the one suggested in this paper ( $10^{-9}$ ), reproduces repeatable effects.

The results of the pain attenuation are simply a clinical observation when using 2 dissimilar ASP needles, which appears to amplify the effect better than 2 ASP gold needles placed in the same acupoint. Burns has suggested that the needles are placed not so much in the same acupoint as it is an "acupoint zone."

## CONCLUSIONS

It is obvious that a clinical trial needs to be performed confirming the results of this technique update. A future project should consist of determining pain attenuation of 2 dissimilar ASP needles in the acuzone. We have demonstrated for the first time that comparatively very strong electrical stimulation of Battlefield Acupuncture points leads to distinctive, reproducible changes in brain function. Perhaps comparatively small electric currents lead to similar, though perhaps minor, effects? Technology exists to measure the electrolyte presence and the very small electrical currents that may be generated. Clinicians may attempt to validate the observation in their own clinical practice.

## DISCLOSURE STATEMENT

No financial interests exist.

## REFERENCES

1. Niemtzw RC. Battlefield acupuncture. *Medical Acupuncture*. 2007;19(4):225–228.
2. [Http://www.cartage.org.lb/en/themes/sciences/physics/electromagnetism /Electrostatics/Electricfield/Newelectricity/Newelectricity.htm](http://www.cartage.org.lb/en/themes/sciences/physics/electromagnetism/Electrostatics/Electricfield/Newelectricity/Newelectricity.htm). Accessibility verified November 14, 2008.
3. McSwiney BA. The composition of human perspiration. [hHttp://www.pubmedcentral.nih.gov/pagerender.fcgi?artid=2205022&pageindex=1](http://www.pubmedcentral.nih.gov/pagerender.fcgi?artid=2205022&pageindex=1). Accessibility verified November 14, 2008.
4. Niemtzw RC. Transmembrane potentials of human lymphocytes. In: *Transmembrane Potentials and Characteristics of Immune and Tumor Cells*. Boca Raton, FL: CRC Press; 1985.
5. Széles JC, Litscher G. Objectivation of cerebral effects with a new continuous electrical auricular stimulation technique for pain management. *Neurol Res*. 2004;26:797–800.
6. Plonsey R, Barr RC. *Bioelectricity*. New York, NY: Plenum Press; 1988.
7. Neuman MR. Biopotential electrodes. In: Bronzino JD, ed. *The Biomedical Engineering Handbook*. Boca Raton, FL: CRC Press; 1995.
8. Litscher G. Bioengineering assessment of acupuncture, part 5: cerebral near-infrared spectroscopy. *Critical Reviews in Biomedical Engineering*. 2006;34(6):439–457.

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**NIEMTZOW**

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**To what does asterisk refer to?**