PART I

STUDIES IN BIOENERGETIC CORRELATIONS

Bioenergetic Regulatory Measurement Instruments and Devices

Fred M.K. Lam, Jr., M.D., *Julia J. Tsuei*, M.D., *Zixian Zhao*, M.D., M.S.
Center for East-West Medicine
University of Hawaii at Manoa

Abstract: Various instruments, designed to measure the body's bioenergy by the Electro-Acupuncture According to Voll (EAV) diagnostic methods are compared so that data from subsequent studies using these instruments can be evaluated with the same baseline. In addition, other instruments were checked for reliability.

FOR THE PAST 33 years the Dermatron,[1,2] manufactured by the Pitterling Co. of West Germany, has been the primary instrument for measuring EAV (Electroacupuncture According to Voll). Recently, the use of EAV has become more widespread, and other similar instruments have come into use. This article evaluates the alternative instruments by using the Dermatron as the standard. Uniform measurement instruments are especially important because research on bioenergetic testing requires a measurement standard by which comparative studies can be evaluated.

The Measurement Instrument

According to Dr. Reinhold Voll,[1,2,3] the major developer of the EAV diagnostic technique, the basic circuit in the Dermatron and all other similar instruments is a simple ohm-meter.[4] This ohm-meter was designed to deliver approximately 10-12 microamperes direct electric current at 1-1.25 volts. The scale of the meter was calibrated at 0-100. When the measurement of the skin at the acupuncture point was 50, the resistance at the point measured 100 K-ohms. The minimum value of zero represented infinite resistance (no electrical activity), and the maximum value of 100 indicated zero resistance at this voltage and amperage.

Because the meter was in the 0 to 12 microampere range, the metering circuit in most instruments had a transistorized amplifier to allow use of a less sensitive and less expensive meter. In the main metering circuit of these instruments, a sensitive volt meter or a microampere meter is placed in series with a battery. A resistor is added to protect the meter and to keep the current in the low microampere range, and an adjustable resistor is used to set the meter at full scale when the test leads are shorted together.

The main testing probe usually has a brass or silver pointer tip and is attached to the positive side of the circuit; the indifferent hand electrode, or grounding negative side, is attached to a plug connected to a brass tube. When medicine testing[2] is in use, this plug is also connected to an aluminum antenna testing well. The currents and voltages used are in the physiological range of the human body (see Figure 1).

Keywords: Acupuncture, Bioenergetic Measurements, electroacupuncture, EAV, Voll, Dermatron, Vegatest, Interro, Mora, Acupath, Chin Value Meter.

Please address correspondence and reprint requests to: Julia J. Tsuei, M.D., 46-418 Hulupala Place, Honolulu, Hawaii 96744.

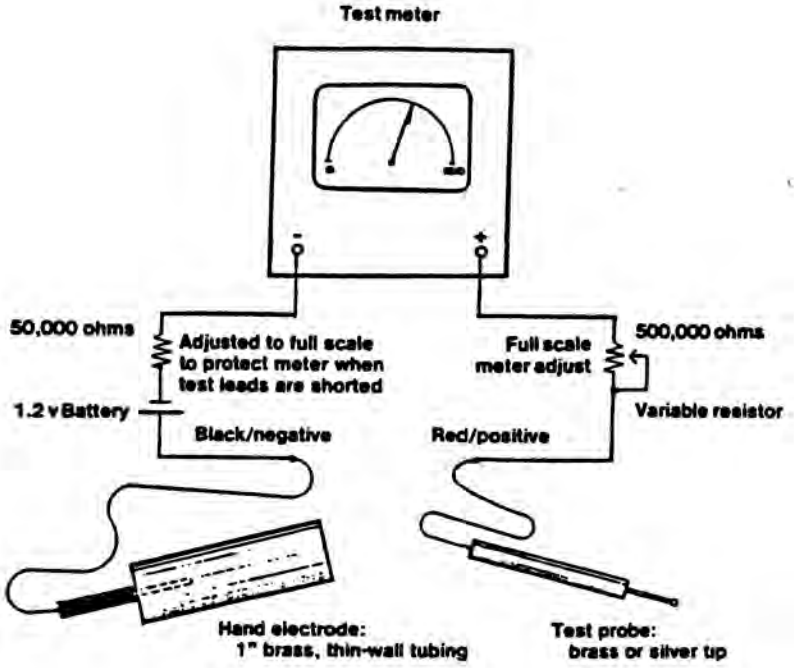

Figure 1.

Basic diagram of electro-acupuncture measurement instruments

The stability of an instrument is vital because the basic purpose of EAV measurement is to determine the "peak reading." The next measurement is the length of the drop in terms of the deflection of the meter and the time period over which the deflection occurs.

Using the Dermatron instrument, Dr. Voll established certain parameters for the interpretation of meter readings; i.e., certain ranges of meter scale readings indicate different pathological conditions. For example, he reported that the meter reading for "normal" is 50 and that when the acupuncture points are in the normal, physiologically balanced condition, the point of maximum deflection of the meter should remain at a stable level.

If a deflection occurs from the peak meter reading and if the deflection continues to drop before the next stable measurement reading is attained, this change is referred to as the "indicator drop" (ID). A measurable ID is indicative of degeneration taking place in the organ being measured. If a meter is too sensitive it may "overshoot," thus giving a false deflection of the meter readings. This is mainly caused by the inertial force of the rapid movement of the meter pointer and not by organic degeneration. On the other hand, if a meter is not sufficiently sensitive, the ID may not accurately depict the degree of organ degeneration.

Dr. Voll stated that the rising time of the meter pointer could indicate an inflammatory process when the meter rose rapidly and that a slow rising time could indicate the beginning process of degeneration. To prevent overswinging of the meter pointer, which would produce a false "indicator drop" reading, some instruments used a dampening of the meter pointer movement so that the slowed rate of the rising time of meter movement would reduce the amount of over-shooting of the meter pointer. However, if the meter movement is slowed down too much in its rising time, the indication of an inflammatory process by a rapidly rising meter reading may be dis-

torted.

In bioenergetic research the accuracy and the persistency of the readings are extremely important, and thus it is necessary to know which testing instruments are comparable, and each instrument must be evaluated by the same standard.

Some instruments were designed to measure different indicators. When the EAV technique for bioenergetic measurement is used, the initial reading and indicator-drop reading are the most important of the diagnostic indicators. Some other instruments, which had a different purpose, paid greater attention to the difference between a normal reading and an abnormal reading, as used in the Vega testing device.[5] Instead of depending on each specific acupuncture point for the evaluation of the organs and meridians, the Vegatest method uses medicine testing techniques on a few acupuncture points. The use of special homeopathic organ preparations helps to determine which organs are disturbed, and nosodes identify diseases and toxins that relate to these organs. Additional medicine testing will assist in determining the optimal and tolerated effective treatments of drugs or homeopathic remedies.[1-7]

The Acupath[6,7] and the Interro are computerized instruments that use medicine testing as their main function. They compare the initial reading of the measurement point and then test to normalize the point with medicine testing by adjusting the test remedies and medications so that the instruments read close to the mid-scale point. The instruments register all the readings by computers including charts and numbers as the actual patient record. The Dermatron, Chin Value detector, and the Computronix also have computer recording capabilities when computerized programs are attached. The computer programs were not evaluated in this study.

Procedure for Testing the Equipment

In this study a digital volt-ohm multimeter made by Triplett Co., Model 3550, was used for all the measurements. Any good quality, high impedance volt-ohm multimeter can be used to duplicate the evaluations.

1. Battery voltage: The voltage was read directly across the stylus probe and hand-held electrode with the multimeter set to read voltage in the 0 to 2 volt range, or higher if necessary.

2. Meter reading: To determine the meter reading with a test load of 100 K-ohms, a 100 K-ohm resistor was placed across the stylus probe and the hand-held electrode, and then the instrument meter scale was read and recorded in units.

3. Impedance of the instrument at mid-scale: To measure the actual impedance of the instrument at mid-scale, a phantom load variable resistor of 250 K-ohms was used. The load resistor was adjusted to have the instrument meter read exactly mid-scale with the load across the main stylus and hand-held electrode. The variable resistor load was measured with the ohm meter of the multimeter.

4. Measurement at full scale: Current measurement of the instrument at full scale was measured by setting the ampere meter of the multimeter at the 20 microampere scale across the main stylus probe and the hand-held electrode and then by adjusting it so that the full-scale adjustment of the instrument could be read at full scale, and the current of the meter was read in microamperes.

5. Rising time of the meter movement: To check the rising time of the meter movement from 0 to full scale, the probe and ground electrode were shorted, and the time required for the meter to go from the zero reading to the full scale reading was recorded.

6. Meter over-swing: The amount of meter over-swing was evaluated by setting the instrument meter to read 80 percent of the full-scale reading when a phantom load resistor was placed across the main probe and the hand-held electrode. The phantom load was adjusted by varying a 250 K-ohm pot (variable resistor) across the load. Next, the probe was removed from the end of the variable resistor, and the main stylus probe was placed at that same point on the adjusted variable resistor of the side opposite to the hand-held electrode. The highest reading of the meter swing and the point at which the meter finally stabilizes was

Table 1.

Summary of instrument measurements

Name of Instrument	Meter Scale Units	Battery Voltage	Current micro-amps full scale	100 K-ohms phantom-load meter units	Mid-scale K-ohms	Ind-drop at 80% phantom load	Rise time to full scale-sec
Chin Value Meter (R.O.C.)	0-200	1.24 V	12.00 uA	105.0	107.3	0	< 1 Sec
Adj. Chin Value Meter (R.O.C.)	0-100	1.24 V	12.00 uA	52.5	107.3	0	< 1 Sec
Computronix Computer (U.S.A.)	0-100	1.26 V	12.40 uA	49.4	100.4	0-2	< 1 Sec
Computronix programmed as Vega instrument (U.S.A.)	0-100	1.56 V	9.60 uA	62.0	160.0	0-2	< 1 Sec
Dermatron (West Germany)	0-100	1.20 V	12.00 uA	48.0	92.3	0	< 1 Sec
Dermatron: newest model (West Germany)	0-100	1.29 V	12.70 uA	49.0	98.3	2	< 1 Sec
Interro Computer (U.S.A.)	0-100	6.36 V	272.70 uA	50.0	99.5	0	< 1 Sec
Interro Portable Computer (U.S.A.)	0-100	5.10 V	114.00 uA	52.0	109.0	0	2 Sec
K+E Diatheracupuncture Original (W. Germany)	0-100	2.07 V	12.25 uA	--	95.0	--	----
Lam EAV Exp. Meter (U.S.A.)	0-100	1.00 V	10.00 uA	50.00	100.0	0	< 1 Sec
Lam EAV Led Meter (U.S.A.)	0-100	1.00 V	10.00 uA	50.00	100.0	0	Instant
Photonic Meter Digital Led (Canada)	0-200	4.98 V	67.00 uA	141.00	174.5	0	Digital
Vegatest II Meter (West Germany)	0-100	1.52 V	10.10 uA	63.0	165.9	0	< 1 Sec
VGH 82 Skylark (R.O.C.)	0-200	1.25 V	12.50 uA	96.0	90.9	6	< 1 Sec
Adj. VGH 82 Skylark (R.O.CO)	0-100	1.25 V	12.50 uA	48.0	90.9	6	< 1 Sec
RH 10 Med-Tronik Mora Therapy (W. Ger)	0-100	1.20 V	12.00 uA	47.0	92.4	2	1.3 Sec

recorded.

7. Computer capability: The Dermatron, Chin-Value meter, and the Computronix all have computer recording capabilities when computerized programs are attached. This was not evaluated in this study.

The measurements of all these instruments are shown in Table 1.

Conclusion

All of the instruments tested are similar in basic design and can measure EAV. However, the study results show that certain differences in the instruments must be taken into account when the parameters of operation are defined. The most difficult design parameter is eliminating the false indicator drop. Consequently, when testing for the peak reading and indicator drop, this over-swing of the meter pointer caused an inappropriately larger indicator drop resulting in an error of readings.

The instruments that used meter movements of different current ratings and battery voltages of a different ratio of volt/amp. in turn changed the calibration scale to fix the center scale at a different point on the meter. Several instruments used different battery voltages that required meters of different current ratings and sensitivities, and they gave a center scale resistance of a different impedance from the 100 K-ohms required for a normal reading. Several instruments which are used primarily for medicine testing, gave readings that were far from the standard. When these instruments are used as an EAV instrument, they require a different end point for the "normal value." For example, the Vegatest instrument could use 60, instead of 50, as the end point for a normal reading, and then the reading would be comparable.

The two Dermatrons, Chin Value meter, Computronix, VGH 82 Skylark, Lam meters, and the RM10 Mora meter could all be used comparably. The Interro computer instruments, Vegatest meter, and Photonic meter could be used with some modifications, but additional study will be required to determine "normal" value and other operational parameters.

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