

# Electric Diagnosis in Acupuncture

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**Abstract:** Study of the electrical properties (resistance and/or potentials) of some command points (Jing Distal, Back-Shu, Front-Mu, and Yuan-Source) are proposed as indicators of the energy imbalance of the twelve main meridians. The most appropriate for this purpose proved to be the Jing Distal points, having an important role in energy exchanges that take place at the level of the meridians which they serve. An energy excess is indicated by a low electric resistance and/or high electric potentials; a deficiency in energy is indicated by a high electric resistance and/or a low electric potential.

ONE OF THE major difficulties in acupuncture is the matter of *energy diagnosis*. To acquire the methodology of diagnosis by anamnesis, inspection, palpation and auscultation demands long training and, perhaps, a special inclination towards synthesis. From the start it should be emphasized that nothing can replace clinical experience, so that any technical means used for diagnostic purposes can only be of secondary value.

Of the *paraclinical* approaches in the area of energy diagnosis, two are of practical interest: (a) mechanical or electronic recording of the radial pulse, and (b) study of the electric properties of the acupuncture points.

As may be seen from Table 1, the electric properties of acupuncture points occupy an important place among the functional properties of these points.

The first to provide evidence of the lower electric resistance of acupuncture points than of the surrounding area was Yoshio Nakatani of Japan,<sup>1</sup> who developed the Ryodoraku technique, and in Europe Niboyet,<sup>2</sup> Bratu,<sup>3,4</sup> and

Brunet.<sup>5,6</sup> The problem was subsequently studied extensively by numerous authors and the data recently reviewed by Zhu Zongxiang.<sup>7</sup>

Study of the electric resistance of some acupuncture points for diagnostic purposes was initiated by Nakatani,<sup>1</sup> Bratu et al.,<sup>4</sup> Ionescu-Tirgoviste,<sup>8-10</sup> and Wing.<sup>11</sup>

In 1954 Nakatani<sup>1</sup> discovered that acupuncture points present low electric resistance; he then used this for the diagnosis of imbalanced meridians, and later developed the "Neurometer," consisting of a 0-200 micro-ampere meter, with a power supply of 12, 18 or 21 volts DC. The patient holds in his hand the mass electrode and the acupuncture points are tested with a search electrode tip. The apparatus delivers a DC current which aims at establishing the energy balance in the meridians formed in excess or in deficiency.

Variants of this method were also developed by Voll<sup>12</sup> and Wing.<sup>11</sup>

Table 1.

Functional particularities of the skin areas used in acupuncture.

1. Low threshold of painful sensitivity.
2. High local temperature.
3. Increased "cutaneous respiration" (great uptake of CO<sub>2</sub> at the level of the points).
4. Low electric resistance, explored either by DC or by AC current (20 to 250 K $\Omega$ ).
5. High electric capacity values (0.1 - 1  $\mu$ F).
6. High electric potentials (up to 350 mV).

### Acupuncture Points Used for Diagnosis

Study of the behavior of acupuncture points demonstrates continuous dynamics, manifested by the so-called 'fenestration-occlusion' phenomenon.<sup>13</sup> Electric resistance falls with a parallel increase in their surface ('fenestration') when the organ upon which the point depends, correlatively presents excessive energy: in contrast, return to normal of the functional-state of the correlating organ is expressed by increased electric resistance of the points and diminution of their surface ('occlusion').

As the functional value of the different points of a meridian is unequal, several command points were used for study of their electrical properties for diagnostic purposes (Table 2).

**Table 2.**

Command points whose electric properties were taken as indicating the meridian energy state.

Points Used	Author
Yuan (Source) points	Nakatani <sup>1</sup>
Anterior Mu (Alarm) points	Bratu, <sup>4</sup> Ionescu-Tirgoviste <sup>9, 10</sup>
Posterior Shu points (Associated)	Nagayama, <sup>14</sup> Wing <sup>11</sup>
Distal Jing points	Ionescu Tirgoviste <sup>15</sup>

Choice of the different points for testing must keep account of the following:

(a) They must be in a region where the background electric resistance of the skin is relatively constant. From this viewpoint, the order of preference of the different points proposed would be: Jing distal, Shu posterior, Mu anterior, Yuan (Source).

(b) The points must have a precise relation with the twelve meridians. The order of preference of the different points would be: Jing distal, Mu anterior, Shu posterior, and Yuan (Source).

(c) The points must be readily localized, the order of preference from this point of view being: Jing distal, Shu posterior, Yuan (Source), Mu anterior.

### Advantages of Testing the Jing Distal Points

The Jing distal points are situated slightly outside the nail angles of the fingers and toes (Fig. 1). Six of them (KI-1, Liv-1, SP-1, SI-1, TW-1, LI-1) are *entrance points* to the meridians and the other six (BL-67, GB-44, ST-45, HT-9, PC-9, LU-11) are *exit points* from the meridians. The six Jing distal points of the lower extremities also represent the site from which start the six *energy axes* (Fig. 2), shown in Table 3.

**Table 3.**  
The six energy axes.

	Energy Axis	Starting Point	Exit Point
Yang	Tai Yang	BL-67	SI-1
	Shao Yang	GB-44	TW-1
	Yang Ming	ST-45	LI-1
Yin	Tai Yin	KI-1	HT-9
	Jue Yin	LV-1	PC-9
	Shao Yin	SP-1	LU-11

The Jing distal points form part of the 66 antique points, having an important role in *energy exchanges* that take place at the level of the meridians which they serve.

At the Jing points a communication occurs (via a small secondary vessel) in the flow of Ying Qi energy between two coupled meridians, one Yang and the other Yin.

The Jing distal points realize at the same time a transfer of Wei Qi energy from the main meridian to the tendino-muscular meridian, whose point of origin it is (Fig. 3).

The Jing point regulates the transfer of Shen Qi energy in the divergent meridian which, in its first portion, has a common course with the main meridian.

The Jing distal points of the lower extremities represent the entrance into the six energy levels (axes) of the external pathogenic energies (Fig. 3).

It results therefore that the Jing distal points, by their privileged anatomical position and their important role in the energy economy of the body, may be considered as command

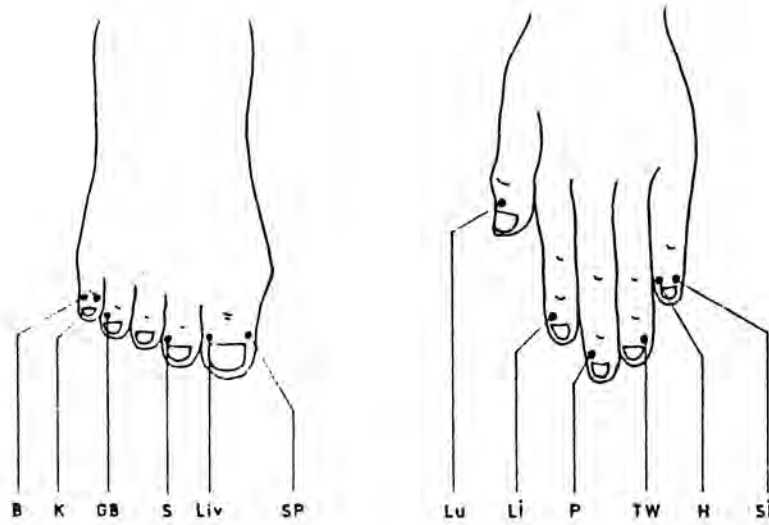


Fig. 1.  
The location of Jing distal points.

points whose functional state might furnish information on the *quantity* and *quality* of energy of the meridian on which they are to be found.

### The Study of Electric Parameters

The electrical properties at the level of Jing distal points are: (a) skin electric resistance and/or (b) skin electric potential.

Skin electric resistance may be determined by a simple apparatus having a power source, an ohmmeter and two electrodes (mass and search electrode). The values may be recorded in Ohms or in arbitrary units. The disadvantage of determining skin electric resistance consists in the multiple factors that may influence it, some deriving from the body, others from the technique itself (Table 4).

Table 4.

Variation factors of skin electric resistance.

Physiologic factors	Age Sex Parasympathetic/sympathetic balance Moisture of the skin (respiration)
Physical factors	Environmental temperature Electromagnetic fields Solar activity
Measuring technique	Surface of the electrode Pressure applied

Most of these factors influence the absolute value of skin electric resistance but not also the relationships between the values obtained at different points. In other words, the same factor of error may modify, in the same sense and by the same order of magnitude all the electric resistance values of the Jing distal points. However, as the relationship between these points is of prime importance, their study may furnish useful information on the functional state of the respective meridians.

Determination of the *skin electric potential* requires more costly devices; the values expressed in mV may be automatically displayed. The potential is less influenced by the physiological or physical factors listed in Table 4. Hence, study of the skin potentials at Jing distal points may be used in research. Here

too, comparative analysis of the values obtained on the twelve meridians is of immediate diagnostic value.

Parallel study of skin electric resistance and potential indicate an inverse and as a rule parallel variation: marked resistance evolves with a low potential indicating *deficient* energy of the meridian; low resistance evolves with a high potential signifying *excess* energy of the meridian.

### The Akabane Test

In 1952 Kobei Akabane, a Japanese physician, observed that during a disease some of the Jing distal points became spontaneously painful, but this hypersensitivity disappeared with recovery.<sup>16,17</sup> Akabane constructed a simple wire basket wherein he inserted an incense stick. With its burning tip he then did quick regular passes over the skin in the vicinity of nail roots on fingers and toes (Jing distal points are named also entrance and exit points). He noted for each of the twelve Jing distal points the number of passes from the beginning to the abrupt feeling of heat. Kajdos<sup>16</sup> found a simpler method: he held the burning tip of a cigarette 1 cm over the twelve points, the number of passes being replaced by the number of seconds (measured with a stopwatch) until the patients indicated the change of warmth into heat.

Regardless of the technique used, an increased thermal sensitivity threshold—meaning excess energy of the meridian—has the same significance as decreased electric resistance and high electric potential; a low reading (decreased thermal sensitivity) or high resistance and low potential indicates deficiency of energy.

### How To Determine Electric Resistance and Electric Potential

Regardless of which of the electric parameters is measured, the technique is the same. The patient either lies down or sits in an armchair. The points to be studied are wiped with alcohol. The patient holds the mass electrode and the search electrode is successively placed on the twelve Jing distal points.

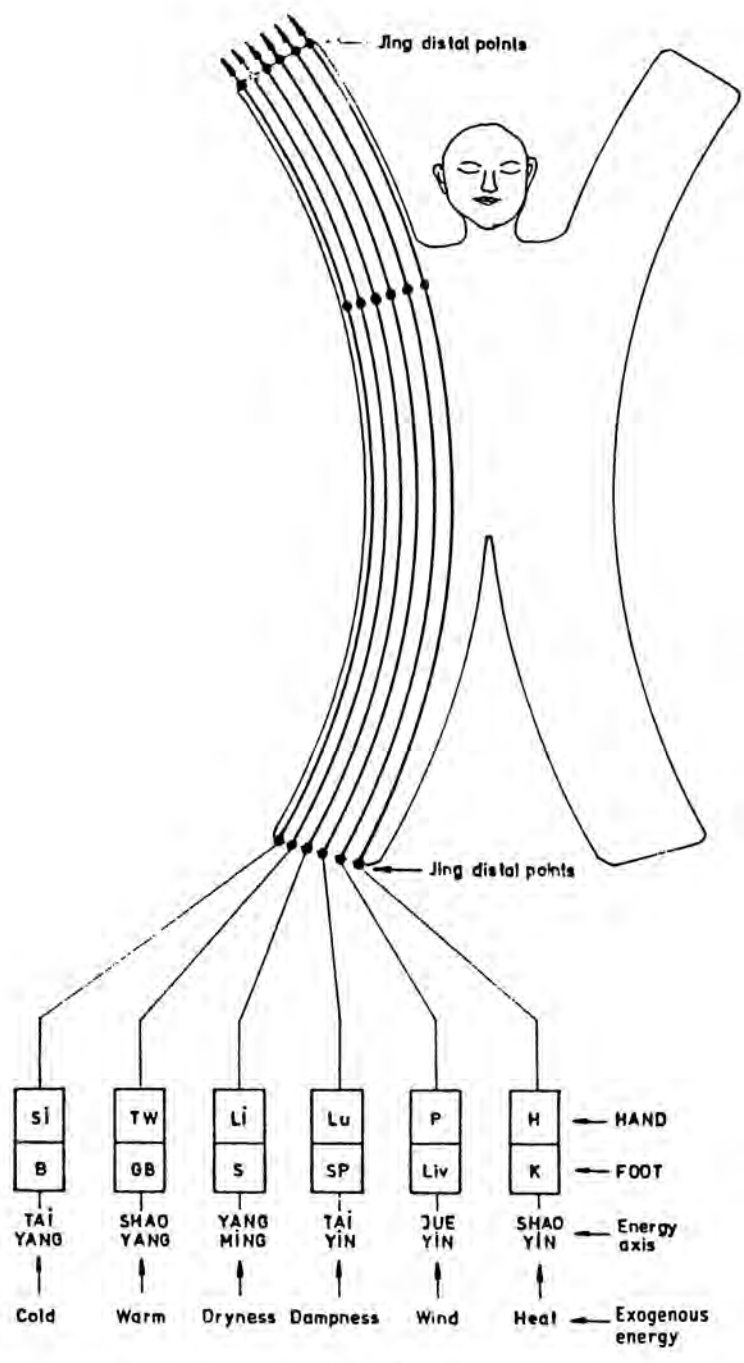
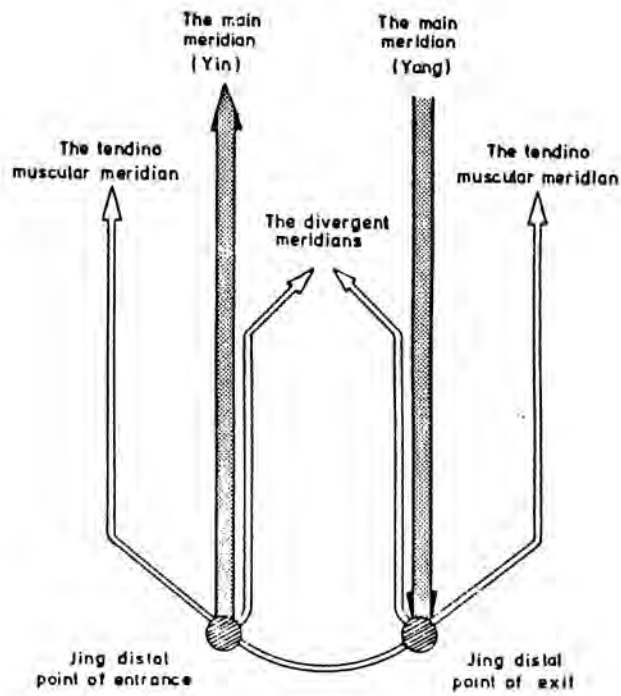
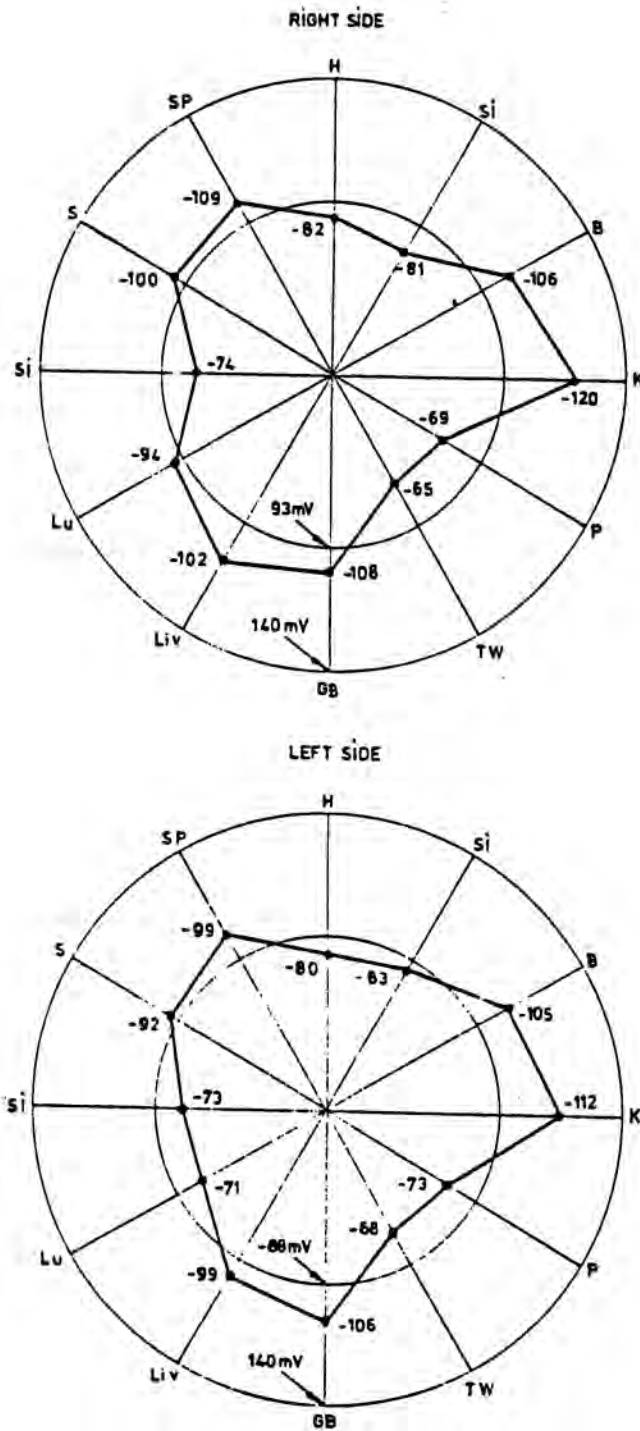


Fig. 2.  
The six energy axes.

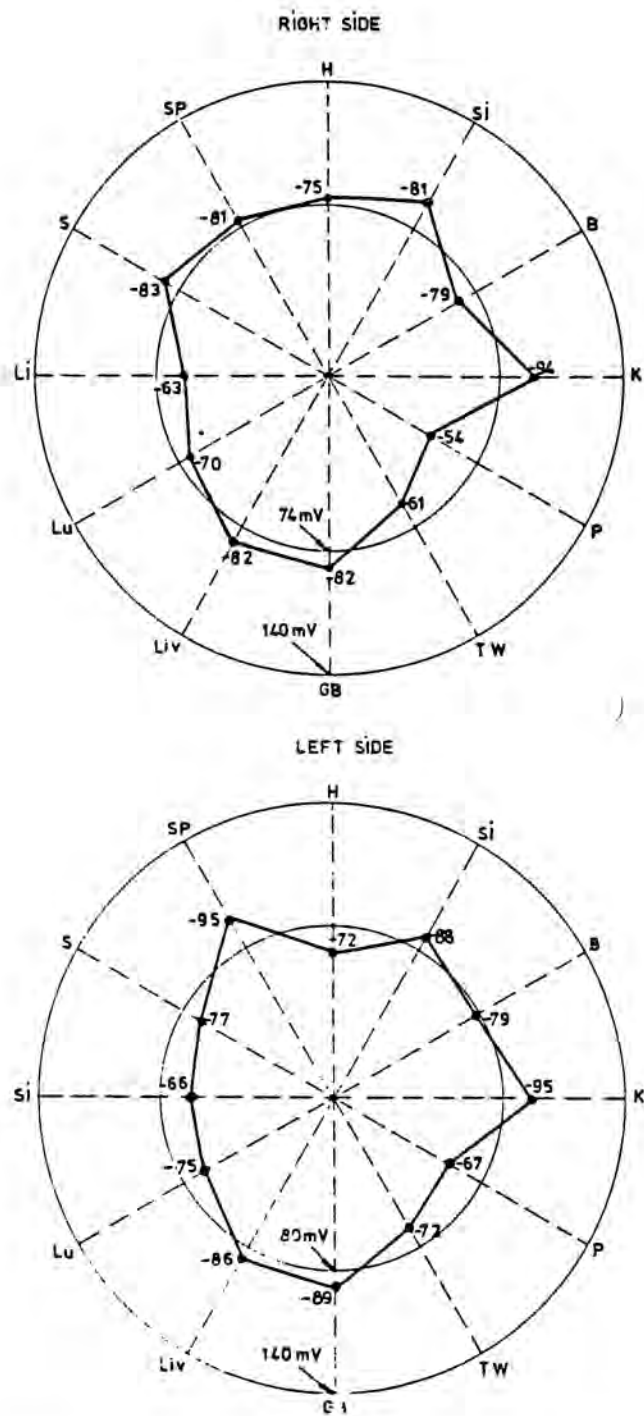


**Fig. 3.**  
The functions of Jing distal points in the energy circulation.



**Fig. 4.**  
The mean values of the electric potentials in Jing distal points in 30 cases with diabetes mellitus.





**Fig. 5.**  
The mean values of the electric potentials in Jing distal points in 40 cases with diabetic polyneuropathy.



After turning on the apparatus, the "0" position of the indicator needle is checked, the value of each point is measured, initially in the right and left arm, then the right and left lower extremity.

It is of importance (especially for determining electric resistance) for the electrode-skin contact pressure at each point studied to be constant and the reading to be done every two seconds after placing the search electrode on the point.

Individual measurements (right and left) of the twelve meridians of the same individual are used to obtain the "mean value," which is the "reference" value of the readings for the subject studied. Readings of meridians in excess of this averaged reading will have a low electric resistance and/or high electric potential; others, a high electric resistance and/or low electric potential. The former are considered to be *excessive* in energy, the latter *deficient* in energy.

The comparative elements that must be taken into consideration on analyzing the results are:

- marked difference between the same point Jing on the right and left, using the symbols + and - to denote differences versus the averaged readings. As a rule, right-left differences are not significant;

- readings that are greater than the mean value (excess energy) or less than the mean value (deficient in energy);

- too great differences between the mean values recorded on the Jing points of the hands as compared to the Jing points of the feet. Normally, the mean potential recorded on the Jing points of the hands is greater than that recorded on the Jing points of the feet (Yang physiologic predominance in the upper part of the body). For this reason, equal values of the Jing points on the hands and feet may indicate energy deficiency in the upper part of the body or excess energy in the lower part of the body;

- differences in the values recorded on the Jing points of the six Yang meridians as compared to those on the six Yin meridians;

- a mean value of the Jing points too great or too small with regard to that recorded in other individuals. If there is no notable differ-

ence between the state of the different Jing points, this might express a particular vegetative tonus; sympathetic hypertonia if electric resistance is low and the electric potential high; parasympathetic hypertonia if electric resistance is high and the electric potential low.

In order to obtain a general image of the functional state of the different meridians, the values obtained in each patient are plotted within a circle representing the energy circulation in the twelve meridians. The inner circle represents the "mean value" calculated per individual, and which may be greater or smaller (Figs. 4 and 5). Comparatively, some meridians will be in excess (outside the inner circle) and others deficient (within the inner circle).

### Energy Equilibration Technique

According to the classical data, in the presence of several impaired meridians, the most physiologic treatment consists in reinforcing of the empty (deficient) meridians. This may be done by using all the classical rules that derive from the functional relations between the meridians; therefore, the deficient energy of a meridian may be treated by:

- reinforcing of the tonification points which may be associated with the Luo and the Yuan (Source) points;

- reinforcing of the Mu (anterior) Alarm point;

- reinforcing of the Shu (posterior) Associated point.

Referring to the example given in Fig. 5, the reinforced points will be: PC-9, BL-14 and CV-17 for the deficient Pericardium meridian; TW-3, BL-22 and CV-5 for the deficient Triple Warmer meridian, and SI-3, BL-27 and CV-4 for the Small Intestine deficient meridian.

In general, only the meridians in great excess or marked energy deficiency should be approached therapeutically. A parallel equilibration of the other disturbed meridians showing a lesser imbalance will normalize the situation.

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