

## Can Emotion Be Quantified?

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In Western science, the study and treatment of emotion belongs to the fields of psychology and psychiatry. As far as I know emotion in current medical science is still largely a subjective matter. If someone is in grief, it is mainly a subjective feeling. It is difficult to have an objective quantitative criteria of the amount of grief that a person suffers.

The direction of current medical science is to investigate the role of the brain in the control of a person's emotion. We wish to take an alternative route. In Chinese medicine, emotion is not a subjective matter, but has a material basis. Five emotions are associated with five meridians (There is some ambiguity if the five emotions are associated with five organs or five meridians. Also, the heart is associated with two meridians: the Heart and the Pericardium):

- Fear is associated with the Kidney meridian.
- Grief is associated with the Lung meridian.
- Joy is associated with the Pericardium meridian
- Worry is associated with the Spleen meridian.

Practitioners of Chinese medicine could diagnose the emotional states of a patient by feeling the pulse on the wrist. The feelings of these practitioners comes from personal experiences in practice. It is difficult to quantify these personal subjective experiences. Despite a great deal of research effort in the last 50 years, there is not a universally accepted measuring device on strength of pulses on the wrist that genuinely reflects the experiences of thousands of years of Chinese medicine.

We instead are attempting a different route. *Qi* circulating along these five meridians should represent the state of the five emotions within a person. The more *qi*, the more intense the emotion. From the explanation of *qi* based on quantum field theory, it is measurable and can be quantified. Theoretically these five emotions could be quantified. Infrared imaging may provide a quantitative means of measuring the state of emotions by detecting hot spots or lines along the body surfaces corresponding to the five meridians.

For someone in grief, the Lung meridian may be the place to look for hot spots on the body surface temperature. Infrared (IR) images of a woman in her 50s were taken. The images showed hot spots on her left and right LU2 acupoints near her left and right shoulder, as shown in Fig 1a. The woman drank meridian water, which contains stable water clusters that we believe will repair the meridian ([April 2009 Acupuncture Today](#) for details). Thirty minutes after drinking the water, another IR picture was taken. In Fig. 1a, the two hottest spots around the left and right LU2 region were shown in white. In Fig 1b, they cooled down, and nearly all the white color was gone as it turned to red. The maximum temperatures at two hot spots at LU2 were considerably reduced.

**Fig 1a**

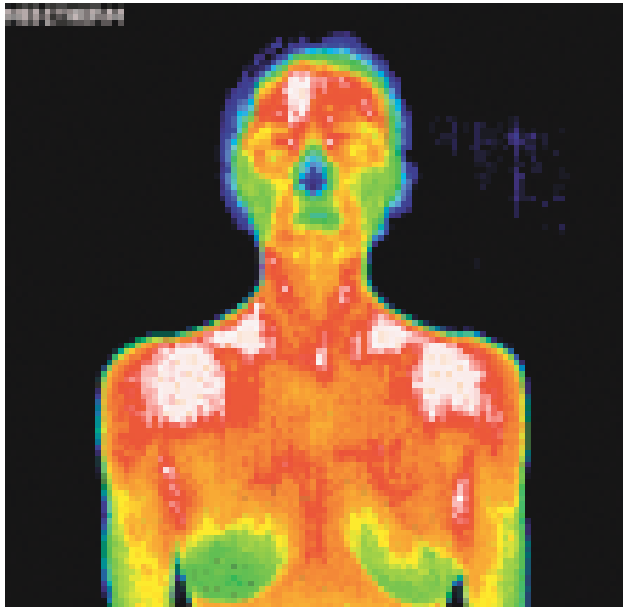


Fig 1a: Surface temperature distribution of a grieving woman before drinking meridian water that contains stable water clusters as revealed by infrared images. The color code is: white as the hottest, then red, yellow, green, blue and black as the coldest.

**Fig 1b**

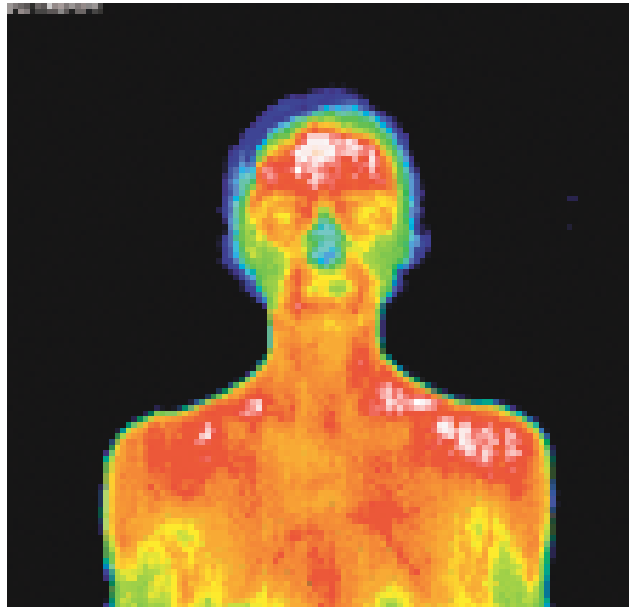


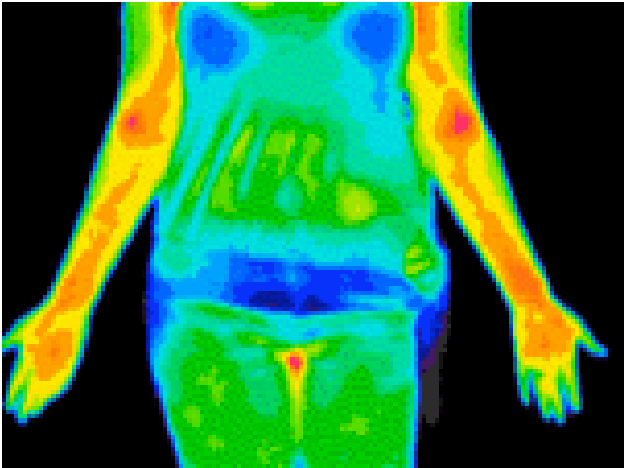
Fig 1b: Surface temperature distribution 30 minutes after drinking the meridian water.

The maximum temperature in the region LU2 may be an objective indicator of the amount of the woman's grief. The relative quantitative reduction of the hottest region may be regarded as a measure of treatment effectiveness. The method may be from acupuncture needles, herbs, medications, nutritional supplements, exercises or healing from external *qi*. The larger the reduction, the more effective the method. In this case, we may infer that the water is effective in reducing temperature around the two regions surrounding the left and right LU2 acupoints.

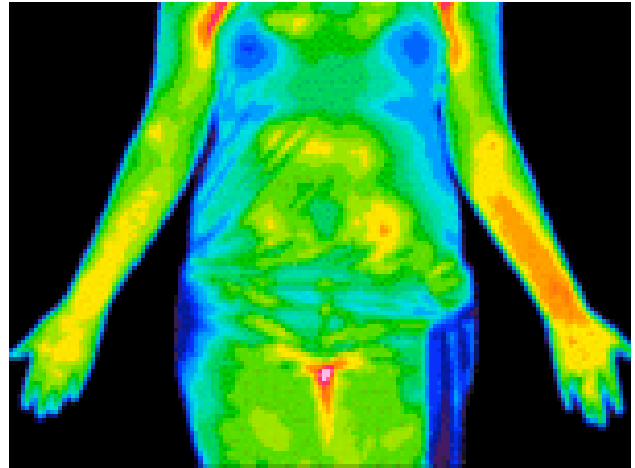
In the second example, a young woman found out that a young man she liked was going to marry another woman. Before she drank the meridian water, we took an IR picture of her arms, as was shown in Fig 2a. There were two broad red bands running along the anterior surface of both left and right arms. Thirty minutes after she drank the meridian water, we took another IR picture of the same area. The broad red regions along her arms were considerably reduced.

We might interpret this result according to Chinese meridian theory. Her sadness was shown as a hot band along the pericardium meridian. Her sadness was reduced after drinking the meridian water. We may attribute the reduction of this region to the water's effectiveness.

**Fig 2a**



**Fig 2b**



Infrared images before (Fig 2a) and 30 minutes after drinking meridian water (Fig 2b).

These two cases and other similar ones suggest that there is a way to substantiate the claim of Chinese medicine that emotions are related to meridian system. By quantitatively measuring the properties of the meridian system with modern instruments such as IR, it may be possible to establish a quantitative medical science for emotions.

Although we used meridian water in these examples, the same method of taking infrared images before and immediately after a treatment can be applied to see the effectiveness of other modalities in Chinese medicine on a person's emotional state.

The infrared imaging system we use does not emit any radiation and is noninvasive. It can be taken as many times as possible without causing any harm to patients. It is relatively low in cost compared to other modern instruments such as functional MRIs, PET scans or CT scans that are now regularly used to study the brain. We urge more acupuncturists and researchers to advance our knowledge of human emotion from the viewpoint of Chinese medicine by using the simple method outlined here.

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