

**Global Effect of Reflexology on Blood Flow**  
**Research Study By M. Piquemal, M.D., E.E.**

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In his research study Dr. Piquemal was able to demonstrate a statistical correlation between five selective reflexology areas of the feet and the dermatomes of the nervous system (dermatomes are innervation of skin segments based on fetal development). That is the effect of reflexology, the expansion of blood vessels, goes beyond the area stimulated and extends to other skin zones and organs in a coherent pattern. Changes were measured using an infra cooled systems connected to a digital video card to a computer.

A Reflexology session was applied to 9 subjects of different social, economical, linguistic, and cultural backgrounds. Each patient was taken to a quiet temperature-controlled room without airflow convection and far removed from artificial light, seated without their clothes on the upper portion of their body and rested for 20 minutes. The first infrared picture was taken. Then the patient laid on his back and rested. Ten minutes later a second thermographic picture was taken of both soles. A reflexotherapy treatment followed for 20 minutes. 10 minutes after the session, a new thermographic picture of the sole was taken. The patient then sat for another 20 minutes and a thermographic picture of the spinal column was taken.

This thermographic data was subsequently converted to a matrix. Thermal changes in both zones (right sole and right paravertebral zone) were converted to a standardized averaged pixel value process in order to be compared and evaluated. Five related organ-skin zones were selected, by a computer program, on both the sole and their counterparts on back, upon which to build a 2X5 numerical thermal matrix for each subject. Thermal changes in both zones (right sole and corresponding zone on the back) were compared. A statistical correlation was established between five cutaneous selective zones of two distant somatotopies (sole and dermatoma). Results of the statistical process showed that change in the thermal pattern on the sole was reflected on the skin of the back for each of the five selected zones. A correlative statistical lead, based on the five rows matrix (organs skin projected zones), computed a coefficient of correlation varying from 0.52 to 0.88. Results of the statistical process for the limited population has shown that change in thermal pattern on soles are reflected on the back for each of the five selected zones related to the five skin organ projection of the lung, liver, stomach, pancreas, and small intestine.

A clear correlation appeared after the reflexotherapy session for each subject regarding blood flow distribution for the sole and its counterpart on the back for the five cutaneous zones studied. It is theorized that the manual skin pressure upon the sole is integrated by sub cortical and/or cortical structures and effected not only at a local level, but also the global level. Information (i.e., the mechanical pressure as one form of energy is converted into another as a nervous flux) is then dispatched from these integrative structures via the autonomic nervous system. This effect acting on blood distribution of inner organs as seen on the dermis of the back as thermal changes is reflected in

the blood flow as either vasodilation or vasoconstriction. The mechanism of action of reflexology seems to act by blood flow redistribution of the autonomic nervous system using presumably a higher integrative nervous structure. Therefore, reflexology appears to be, at least for these five organs, a good therapy for regulating functional blood flow disturbance to these inner organs.

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(A complete copy of Dr. Piquemal's lecture with diagrams and charts is available in the Conference Transcript)