

A Close Look at Therapeutic Touch

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Context.—Therapeutic Touch (TT) is a widely used nursing practice rooted in mysticism but alleged to have a scientific basis. Practitioners of TT claim to treat many medical conditions by using their hands to manipulate a “human energy field” perceptible above the patient’s skin.

Objective.—To investigate whether TT practitioners can actually perceive a “human energy field.”

Design.—Twenty-one practitioners with TT experience from 1 to 27 years were tested under blinded conditions to determine whether they could correctly identify which of their hands was closest to the investigator’s hand. Placement of the investigator’s hand was determined by flipping a coin. Fourteen practitioners were tested 10 times each, and 7 practitioners were tested 20 times each.

Main Outcome Measure.—Practitioners of TT were asked to state whether the investigator’s unseen hand hovered above their right hand or their left hand. To show the validity of TT theory, the practitioners should have been able to locate the investigator’s hand 100% of the time. A score of 50% would be expected through chance alone.

Results.—Practitioners of TT identified the correct hand in only 123 (44%) of 280 trials, which is close to what would be expected for random chance. There was no significant correlation between the practitioner’s score and length of experience ($r=0.23$). The statistical power of this experiment was sufficient to conclude that if TT practitioners could reliably detect a human energy field, the study would have demonstrated this.

Conclusions.—Twenty-one experienced TT practitioners were unable to detect the investigator’s “energy field.” Their failure to substantiate TT’s most fundamental claim is unrefuted evidence that the claims of TT are groundless and that further professional use is unjustified.

JAMA. 1998;279:1005-1010

Therapeutic Touch (TT) is a widely used nursing practice rooted in mysticism but alleged to have a scientific basis. Its practitioners claim to heal or improve many medical problems by manual manipulation of a “human energy field” (HEF) perceptible above the patient’s skin. They also claim to detect illnesses and stimulate recuperative powers through their intention to heal. Therapeutic Touch practice guides¹⁻⁶ describe 3 basic steps, none of which actually requires touching the patient’s body. The first step is centering, in which the prac-

itioner focuses on his or her intent to help the patient. This step resembles meditation and is claimed to benefit the practitioner as well. The second step is assessment, in which the practitioner’s hands, from a distance of 5 to 10 cm, sweep over the patient’s body from head to feet, “at-tuning” to the patient’s condition by becoming aware of “changes in sensory cues” in the hands. The third step is intervention, in which the practitioner’s hands “repattern” the patient’s “energy field” by removing “congestion,” replenishing depleted areas, and smoothing out ill-flowing areas. The resultant “energy balance” purportedly stems disease and allows the patient’s body to heal itself.⁷

Proponents of TT state that they have “seen it work.”⁸ In a 1995 interview, TT’s founder said, “In theory, there should be no limitation on what healing can be accomplished.”⁹ Table 1 lists some claims made for TT in published reports.

BACKGROUND

Professional Recognition

Proponents state that more than 100 000 people worldwide have been trained in TT technique,³⁸ including at least 43 000 health care professionals,²

and that about half of those trained actually practice it.³⁹ Therapeutic Touch is taught in more than 100 colleges and universities in 75 countries.⁵ It is said to be the most recognized technique used by practitioners of holistic nursing.⁴⁰ Considered a nursing intervention, it is used by nurses in at least 80 hospitals in North America,³³ often without the permission or even knowledge of attending physicians.⁴¹⁻⁴³ The policies and procedures books of some institutions recognize TT,⁴⁴ and it is the only treatment for the “energy-field disturbance” diagnosis recognized by the North American Nursing Diagnosis Association.⁴⁵ *RN*, one of the nursing profession’s largest periodicals, has published many articles favorable to TT.⁴⁶⁻⁵²

Many professional nursing organizations promote TT. In 1987, the 50 000-member Order of Nurses of Quebec endorsed TT as a “bona fide” nursing skill.³² The National League for Nursing, the credentialing agency for nursing schools in the United States, denies having an official stand on TT but has promoted it through books and videotapes,^{3,53,54} and the league’s executive director and a recent president are prominent advocates.⁵⁵ The American Nurses’ Association holds TT workshops at its national conventions. Its official journal published the premier articles on TT⁵⁶⁻⁵⁹ as well as a recent article designated for continuing education credits.⁶⁰ The association’s immediate past president has written editorials defending TT against criticism.⁶¹ The American Holistic Nursing Association offers certification in “healing touch,” a TT variant.⁶² The Nurse Healers and Professional Associates Cooperative, which was formed to promote TT, claims about 1200 members.³⁹

The TT Hypothesis

Therapeutic Touch was conceived in the early 1970s by Dolores Krieger, PhD, RN, a faculty member at New York University’s Division of Nursing. Although often presented as a scientific adaptation of “laying-on of hands,”⁶³⁻⁶⁸ TT is imbued with metaphysical ideas.

Krieger initially identified TT’s active agent as *prana*, an ayurvedic, or traditional Indian, concept of “life force.” She stated,

Health is considered a harmonious relationship between the individual and his total environment. There is postulated a continuing in-

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Ms E. Rosa designed and conducted the tests and tabulated her findings. Mr Sarner did the statistical analysis. He and Ms L. Rosa recruited the test subjects, performed the literature analysis, and drafted this report. Dr Barrett added background material and edited the report for publication.

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Table 1.—Claims Made for Therapeutic Touch

Calms colicky infants, ⁹ hospitalized infants, ¹⁰ women in childbirth, ¹¹ trauma patients, ¹² and hospitalized cardiovascular patients ^{13,14}
Promotes bonding between parents and infants ¹⁵
Increases milk let down in breast-feeding mothers ¹⁶
Helps children make sense of the world ¹⁷
Protects nurses from burnout ¹⁸ and effects changes in their lifestyle ¹⁹
Helps to evaluate situations where diagnosis is elusive ⁹
Relieves acute pain, ²⁰ especially from burns ²¹
Relieves nausea, ^{22,23} diarrhea, ⁵ tension headaches, ²⁴ migraine headaches, ²¹ and swelling in edematous legs and arthritic joints ⁷
Decreases inflammation ²⁵
Breaks fever ²¹
Remedies thyroid imbalances ⁵
Helps skin grafts to seed ⁹
Promotes healing of decubitus ulcers ⁷
Alleviates psychosomatic illnesses ⁵
Increases the rate of healing for wounds, bone and muscle injuries, and infections ²⁶
Relieves symptoms of Alzheimer disease, ²⁷ acquired immunodeficiency syndrome, ⁵ menstruation, ²⁸ and premenstrual syndrome ²¹
Is an innovative means of social communication ²⁹
Is effective with the aged, ^{30,31} asthmatic or autistic children, stroke patients, and coma patients ⁹
Supports people with multiple sclerosis and Raynaud disease ³²
Treats measles ³³ and many different forms of cancer ³⁴
Comforts the dying ³⁵⁻³⁷
Helps to bring some dead back to life ²

teracting flow of energies from within the individual outward, and from the environment to the various levels of the individual. Healing, it is said, helps to restore this equilibrium in the ill person. Disease, within this context, is considered an indication of a disturbance in the free flow of the pranic current.⁶⁸

Krieger further postulated that this “pranic current” can be controlled by the will of the healer.

When an individual who is healthy touches an ill person with the intent of helping or healing him, he acts as a transference agent for the flow of prana from himself to the ill person. It was this added input of prana . . . that helped the ill person to overcome his illness or to feel better, more vital.⁶⁸

Others associate all this with the Chinese notion of *qi*, a “life energy” alleged to flow through the human body through invisible “meridians.” Those inspired by mystical healers of India describe this energy as flowing in and out of sites of the body that they call *chakras*.

Soon after its conception, TT became linked with the westernized notions of the late Martha Rogers, dean of nursing at New York University. She asserted that humans do not merely possess energy fields but *are* energy fields and constantly interact with the “environmental field” around them. Rogers dubbed her approach the “Science of Unitary Man,”⁶⁹ which later became known as the more neutral “Science of Unitary Human Beings.” Her nomenclature stimulated the pursuit of TT as a “scientific” practice. Almost all TT discussion today is based

on Rogers’ concepts, although Eastern metaphysical terms such as *chakra*^{2,70} and *yin-yang*⁷¹ are still used.

The HEF postulated by TT theorists resembles the “magnetic fluid” or “animal magnetism” postulated during the 18th century by Anton Mesmer and his followers. Mesmerism held that illnesses are caused by obstacles to the free flow of this fluid and that skilled healers (“sensitives”) could remove these obstacles by making passes with their hands. Some aspects of mesmerism were revived in the 19th century by Theosophy, an occult religion that incorporated Eastern metaphysical concepts and underlies many current New Age ideas.⁷² Dora Kunz, who is considered TT’s codeveloper, was president of the Theosophical Society of America from 1975 to 1987. She collaborated with Krieger on the early TT studies and claims to be a fifth-generation “sensitive” and a “gifted healer.”²⁰

Therapeutic Touch is set apart from many other alternative healing modalities, as well as from scientific medicine, by its emphasis on the healer’s intention. Whereas the testing of most therapies requires controlling for the placebo effect (often influenced by the recipient’s belief about efficacy), TT theorists suggest that the placebo effect is irrelevant. According to Krieger,

Faith on the part of the subject does not make a significant difference in the healing effect. Rather, the role of faith seems to be psychological, affecting his acceptance of his illness or consequent recovery and what this means to him. The healer, on the other hand, must have some belief system that underlies his actions, if one is to attribute rationality to his behavior.⁶⁵

Thus, the TT hypothesis and the entire practice of TT rest on the idea that the patient’s energy field can be detected and intentionally manipulated by the therapist. With this in mind, early practitioners concluded that physical contact might not be necessary.¹³ The thesis that the HEF extends beyond the skin and can be influenced from several centimeters away from the body’s surface is said to have been tested by Janet Quinn, PhD, and reported in her 1982 dissertation.¹⁴ However, that study merely showed no difference between groups of patients who did or did not have actual contact during TT. Although Quinn’s work has never been substantiated, nearly all TT practitioners today use only the noncontact form of TT.

As originally developed by Krieger, TT did involve touch, although clothes and other materials interposed between practitioner and patient were not considered significant.⁵⁶ It was named TT because the aboriginal term *laying-on of hands* was considered an obstacle to acceptance by

“curriculum committees and other institutional bulwarks of today’s society.”⁶⁶ The mysticism has been downplayed, and various scientific-sounding mechanisms have been proposed. These include the therapeutic value of skin-to-skin contact, electron transfer resonance, oxygen uptake by hemoglobin, stereochemical similarities of hemoglobin and chlorophyll, electrostatic potentials influenced by healer brain activity, and unspecified concepts from quantum theory.^{66,67}

Therapeutic Touch is said to be in the vanguard of treatments that allow “healing” to take place, as opposed to the “curing” pejoratively ascribed to mainstream medical practice. Therapeutic Touch supposedly requires little training beyond refining an innate ability to focus one’s intent to heal; the patient’s body then does the rest.⁵ Nurses who claim a unique professional emphasis on caring are said to be specially situated to help patients by using TT.^{56,59} Nonetheless, proponents also state that nearly everyone has an innate ability to learn TT, even small children and juvenile delinquents on parole.^{2,17,32}

Proponents describe the HEF as real and perceptible. Reporting on a pilot study, Krieger claimed that 4 blindfolded men with transected spinal cords “could tell exactly where the nurse’s hands were in their HEFs during the Therapeutic Touch interaction.”⁶⁵ In ordinary TT sessions, practitioners go through motions that supposedly interact with the patient’s energy field, including flicking “excess energy” from their fingertips.³

Therapeutic Touch is claimed to have only beneficial effects.³⁹ However, some proponents warn against overly lengthy sessions or overtreating certain areas of the body. This caution is based on the notion that too much energy can be imparted to a patient, especially an infant, which could lead to hyperactivity.^{5,73,74}

Literature Analysis

Although TT proponents refer to a voluminous and growing body of valid research,^{63,75,76} few studies have been well designed. Some clinical studies, mostly nursing doctoral dissertations, have reported positive results, principally with headache relief, relaxation, and wound healing.* However, the methods, credibility, and significance of these studies have been seriously questioned.^{41,87-95} One prominent proponent questions the validity of the typical placebo control used in these studies.⁹⁶

Two of the authors (L.R. and L.S.) have conducted extensive literature searches covering the years 1972 through 1996.

*References 5, 13, 14, 23, 24, 26, 28, 30, 68, 77-86

Using key words such as *therapeutic touch*, *touch therapies*, *human energy field*, *quackery*, and *alternative medicine*, we have searched MEDLINE, *Index Medicus*, CINAHL, *Dissertation Abstracts*, *Masters Abstracts*, *Science Citation Index*, *Government Publications Index*, *Books in Print*, *National Union Catalog*, *Reader's Guide to Periodical Literature*, and *Alternative Press Index*. We attempted to obtain a full copy of each publication and every additional publication cited in the ones we subsequently collected. During 1997, we continued to monitor the journals most likely to contain material about TT.

These methods have enabled us to identify and obtain 853 reports (or abstracts), of which 609 deal specifically with TT, 224 mention it incidentally, and 20 discuss TT predecessors. Ninety-seven other cited items were either non-published or were published in obscure media we could not locate. Only 83 of the 853 reports described clinical research or other investigations by their authors. Nine of these studies were not quantitative. At most, only 1 (the study by Quinn¹⁴) of the 83 may have demonstrated independent confirmation of any positive study.⁹⁷ (That study was conducted by a close associate of the original researcher.) To our knowledge, no reported study attempted to test whether a TT practitioner could actually detect an HEF.

Of the 74 quantitative studies, 23 were clearly unresponsive. Eight reported no statistically significant results,^{16,58,98-103} 3 admitted to having inadequate samples,^{22,56,104} 2 were inconclusive,^{11,105} and 6 had negative findings.¹⁰⁶⁻¹¹¹ Four attempted independent replications but failed to support the original findings.¹¹²⁻¹¹⁵ To our knowledge, no attempt to conduct experiments to reconcile any of these unresponsive findings has been reported.

In 1994, the University of Colorado Health Sciences Center (UCHSC), Denver, empaneled a scientific jury in response to a challenge to TT in its nursing curriculum. After surveying published research, the panel concluded that "there is not a sufficient body of data, both in quality and quantity, to establish TT as a unique and efficacious healing modality."¹¹⁶

A few months later, a University of Alabama at Birmingham research team declared that their own imminent study (financed by a \$335 000 federal grant) would be "the first real scientific evidence" for TT.^{117,118} This project compared the effects of TT and sham TT on the perception of pain by burn patients. The final report to the funding agency noted statistically significant differences in pain and anxiety in 3 of 7 subjective measurements, but there was no

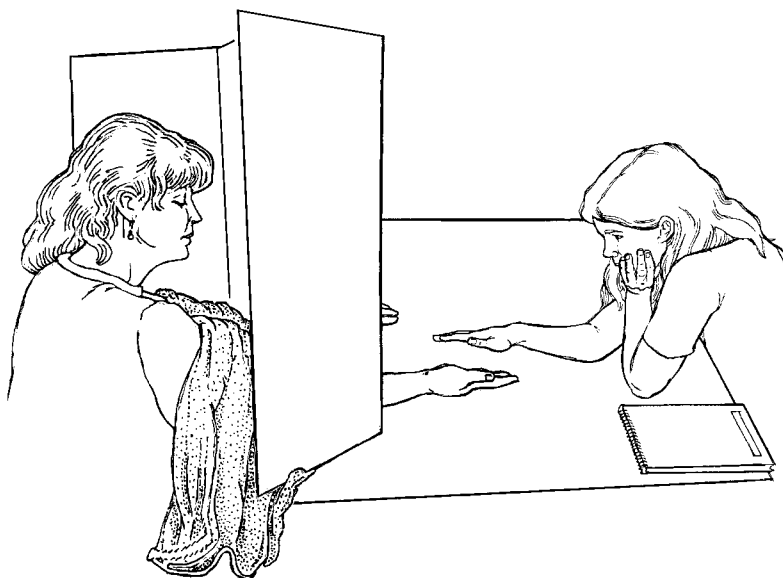


Figure 1.—Experimenter hovers hand over one of subject's hands. Draped towel prevents peeking. Drawing by Pat Linse, Skeptics Society.

difference in the amount of pain medication requested.¹¹⁹

With little clinical or quantitative research to support the practice of TT, proponents have shifted to qualitative research, which merely compiles anecdotes.¹²⁰ This approach, which involves asking subjects what they feel and drawing conclusions from their descriptions,^{17,43,121-128} was sharply criticized by UCHSC's scientific panel.¹¹⁶

Both TT theory and technique require that an HEF be felt in order to impart any therapeutic benefit to a subject. Thus, the definitive test of TT is not a clinical trial of its alleged therapeutic effects, but a test of whether practitioners can perceive HEFs, which they describe, in print and in our study, with such terms as *tingling*, *pulling*, *throbbing*, *hot*, *cold*, *spongy*, and *tactile as taffy*. After doing its own survey, the UCHSC panel declared that no one had "even any ideas about how such research might be conducted."¹¹⁵ This study fills that void.

METHODS

In 1996 and 1997, by searching for advertisements and following other leads, 2 of us (L.R. and L.S.) located 25 TT practitioners in northeastern Colorado, 21 of whom readily agreed to be tested. Of those who did not, 1 stated she was not qualified, 2 gave no reason, and 1 agreed but canceled on the day of the test.

The reported practice experience of those tested ranged from 1 to 27 years. There were 9 nurses, 7 certified massage therapists, 2 laypersons, 1 chiropractor, 1 medical assistant, and 1 phlebotomist. All but 2 were women, which reflects the sex

ratio of the practitioner population. One nurse had published an article on TT in a journal for nurse practitioners.

There were 2 series of tests. In 1996, 15 practitioners were tested at their homes or offices on different days for a period of several months. In 1997, 13 practitioners, including 7 from the first series, were tested in a single day.

The test procedures were explained by 1 of the authors (E.R.), who designed the experiment herself. The first series of tests was conducted when she was 9 years old. The participants were informed that the study would be published as her fourth-grade science-fair project and gave their consent to be tested. The decision to submit the results to a scientific journal was made several months later, after people who heard about the results encouraged publication. The second test series was done at the request of a Public Broadcasting Service television producer who had heard about the first study. Participants in the second series were informed that the test would be videotaped for possible broadcast and gave their consent.

During each test, the practitioners rested their hands, palms up, on a flat surface, approximately 25 to 30 cm apart. To prevent the experimenter's hands from being seen, a tall, opaque screen with cutouts at its base was placed over the subject's arms, and a cloth towel was attached to the screen and draped over them (Figure 1).

Each subject underwent a set of 10 trials. Before each set, the subject was permitted to "center" or make any other mental preparations deemed necessary.

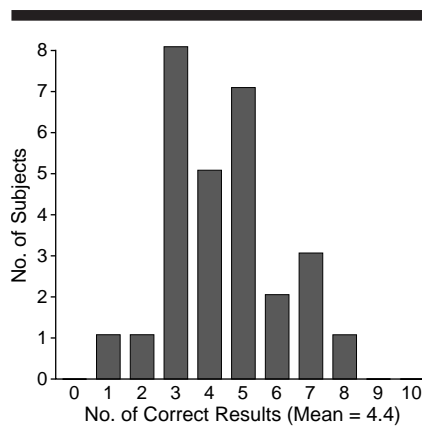


Figure 2.—Distribution of test results.

The experimenter flipped a coin to determine which of the subject's hands would be the target. The experimenter then hovered her right hand, palm down, 8 to 10 cm above the target and said, "Okay." The subject then stated which of his or her hands was nearer to the experimenter's hand. Each subject was permitted to take as much or as little time as necessary to make each determination. The time spent ranged from 7 to 19 minutes per set of trials.

To examine whether air movement or body heat might be detectable by the experimental subjects, preliminary tests were performed on 7 other subjects who had no training or belief in TT. Four were children who were unaware of the purpose of the test. Those results indicated that the apparatus prevented tactile cues from reaching the subject.

The odds of getting 8 of 10 trials correct by chance alone is 45 of 1024 ($P=.04$), a level considered significant in many clinical trials. We decided in advance that an individual would "pass" by making 8 or more correct selections and that those passing the test would be retested, although the retest results would not be included in the group analysis. Results for the group as a whole would not be considered positive unless the average score was above 6.7 at a 90% confidence level.

RESULTS

Initial Test Results

If HEF perception through TT was possible, the experimental subjects should have each been able to detect the experimenter's hand in 10 (100%) of 10 trials. Chance alone would produce an average score of 5 (50%).

Before testing, all participants said they could use TT to significant therapeutic advantage. Each described sensory cues they used to assess and manipulate the HEF. All participants but 1 certified massage therapist expressed high confi-

Table 2.—Statistical Analysis

Statistical Function	Initial Test (n = 15)	Follow-up Test (n = 13)
Mean (95% confidence interval)	4.67 (3.67-5.67)	4.08 (3.17-4.99)
SD	1.74	1.44
α (1-tailed test)	.05	.05
<i>t</i> statistic	-0.7174	-2.222
Upper critical limit of Student <i>t</i> distribution	1.761	1.782
Alternative hypothesis, $\mu = 6.67$	0.9559	0.9801
Alternative hypothesis, $\mu = 7.50$	0.999644	0.999953

dence in their TT abilities, and even the aforementioned certified massage therapist said afterward that she felt she had passed the test to her own satisfaction.

In the initial trial, the subjects stated the correct location of the investigator's hand in 70 (47%) of 150 tries. The number of correct choices ranged from 2 to 8. Only 1 subject scored 8, and that same subject scored only 6 on the retest.

After each set of trials, the results were discussed with the participant. Because all but 1 of the trials could have been considered a failure, the participants usually chose to discuss possible explanations for failure. Their rationalizations included the following: (1) The experimenter left a "memory" of her hand behind, making it increasingly difficult in successive trials to detect the real hand from the memory. However, the first attempts (7 correct and 8 incorrect) scored no better than the rest. Moreover, practitioners should be able to tell whether a field they are sensing is "fresh." (2) The left hand is the "receiver" of energy and the right hand is the "transmitter." Therefore, it can be more difficult to detect the field when it is above the right hand. Of the 72 tests in which the hand was placed above the subjects' right hand, only 27 (38%) had correct responses. In addition, 35 (44%) of 80 incorrect answers involved the allegedly more receptive left hand—consistent with randomness. Moreover, practitioners customarily use both hands to assess. (3) Subjects should be permitted to identify the experimenter's field before beginning actual trials. Each subject could be given an example of the experimenter hovering her hand above each of theirs and told which hand it is. Since the effects of the HEF are described in unobtrusive terms, such a procedure should not be necessary, but including it would remove a possible post hoc objection. Therefore, we did so in the follow-up testing. (4) The experimenter should be more proactive, centering herself and/or attempting to transmit energy through her own

intentionality. This contradicts the fundamental premise of TT, since the experimenter's role is analogous to that of a patient. Only the practitioner's intentionality and preparation (centering) are theoretically necessary. If not so, the early experiments (on relatively uninvolved subjects, such as infants and barley seeds), cited frequently by TT advocates, must also be discounted. (5) Some subjects complained that their hands became so hot after a few trials that they were no longer able to sense the experimenter's HEF or they experienced difficulty doing so. This explanation clashes with TT's basic premise that practitioners can sense and manipulate the HEF with their hands during sessions that typically last 20 to 30 minutes. If practitioners become insensitive after only brief testing, the TT hypothesis is untestable. Those who made this complaint did so after they knew the results, not before. Moreover, only 7 of the 15 first trials produced correct responses.

Follow-up Test Results

The 1997 testing was completed in 1 day and videotaped by a professional film crew. Each subject was allowed to "feel" the investigator's energy field and choose which hand the investigator would use for testing. Seven subjects chose her left hand, and 6 chose her right hand.

The test results were similar to those of the first series. The subjects correctly located the investigator's hand in only 53 (41%) of 130 tries. The number of correct answers ranged from 1 to 7. After learning of their test scores, one participant said he was distracted by the towel over his hands, another said that her hands had been too dry, and several complained that the presence of the television crew had made it difficult to concentrate and/or added to the stress of the test. However, we do not believe that the situation was more stressful or distracting than the settings in which many hospital nurses practice TT (eg, intensive care units). Figure 2 shows the distribution of test results.

Our null hypothesis was that the experimental results would be due to chance ($\mu=5$). Our alternative hypothesis was that the subjects would perform at better than chance levels. The *t* statistic of our data did not exceed the upper critical limit of the Student *t* distribution (Table 2). Therefore, the null hypothesis cannot be rejected at the .05 level of significance for a 1-tailed test, which means that our subjects, with only 123 of 280 correct in the 2 trials, did not perform better than chance.

Our data also showed that if the practitioners could reliably detect an HEF 2 of 3 times, then the probability that either test missed such an effect would be

less than .05. If the practitioners' true detection rate was 3 of 4, then the probability that our experiment missed it would be less than 3 in 10 000. However, if TT theory is correct, practitioners should always be able to sense the energy field of their patients. We would also expect accuracy to increase with experience. However, there was no significant correlation between the practitioners' scores and the length of time they had practiced TT ($r=0.23$). We conclude on both statistical and logical grounds that TT practitioners have no such ability.

COMMENT

Practitioners of TT are generally reluctant to be tested by people who are not proponents. In 1996, the James Randi Educational Foundation offered \$742 000 to anyone who could demonstrate an ability to detect an HEF under conditions similar to those of our study. Although more than 40 000 American practitioners claim to have such an ability, only 1 person attempted the demonstration. She failed, and the offer, now more than \$1.1 million, has had no further volunteers despite extensive recruiting efforts.¹²⁹

We suspect that the present authors were able to secure the cooperation of 21 practitioners because the person conducting the test was a child who displayed no skepticism.

CONCLUSION

Therapeutic touch is grounded on the concept that people have an energy field that is readily detectable (and modifiable) by TT practitioners. However, this study found that 21 experienced practitioners, when blinded, were unable to tell which of their hands was in the experimenter's energy field. The mean correct score for the 28 sets of 10 tests was 4.4, which is close to what would be expected for random guessing.

To our knowledge, no other objective, quantitative study involving more than a few TT practitioners has been published, and no well-designed study demonstrates any health benefit from TT. These facts, together with our experimental findings, suggest that TT claims are groundless and that further use of TT by health professionals is unjustified.

The television program "Scientific American Frontiers" showed excerpts from the second test series on November 19, 1997.

Lisa Feldman Barrett, PhD, Department of Psychology, Boston College, graciously helped with our statistical analyses.

References

1. Boguslawski M. The use of Therapeutic Touch in nursing. *J Continuing Educ Nurs*. 1979;10(4):9-15.
2. Krieger D. *Therapeutic Touch Inner Workbook*. Santa Fe, NM: Bear; 1997:162.

3. Quinn JF. *Therapeutic Touch: Healing Through Human Energy Fields: Theory and Research* [videotapes and study guide]. New York, NY: National League for Nursing; 1994:42-2485-42-2487, 42-2493.
4. Krieger D. *Living the Therapeutic Touch: Healing as a Lifestyle*. New York, NY: Dodd Mead; 1987.
5. Krieger D. *Accepting Your Power to Heal: The Personal Practice of Therapeutic Touch*. Santa Fe, NM: Bear; 1993.
6. Chiappone J. *The Light Touch: An Easy Guide to Hands-on Healing*. Lake Mary, Fla: Holistic Reflections; 1989:14.
7. Quinn JF, Strelkauskas AJ. Psychoimmunologic effects of Therapeutic Touch on practitioners and recently bereaved recipients: a pilot study. *ANS Adv Nurs Sci*. 1993;15(4):13-26.
8. Jarboux D. Nurse knows Therapeutic Touch "works." *Boulder Sunday Camera*. January 2, 1994:3E.
9. Putnam ZE. Using consciousness to heal. *Massage Ther J*. Fall 1995:47-48, 50, 52, 54, 56, 58, 60.
10. Leduc E. Therapeutic Touch. *Neonat Network*. 1987;5(6):46-47.
11. Krieger D. Therapeutic Touch during childbirth preparation by the Lamaze method and its relation to marital satisfaction and state anxiety of the married couple. In: Krieger D. *Living the Therapeutic Touch: Healing as a Lifestyle*. New York, NY: Dodd Mead; 1987:157-187.
12. Glazer S. The mystery of "Therapeutic Touch." *Washington Post*. December 19-26, 1995;Health section:16-17.
13. Heidt PR. Effect of Therapeutic Touch on anxiety level of hospitalized patients. *Nurs Res*. 1981;30(1):32-37.
14. Quinn JF. *An Investigation of the Effects of Therapeutic Touch Done Without Physical Contact on State Anxiety of Hospitalized Cardiovascular Patients* [dissertation]. New York: New York University; 1982.
15. Thayer MB. Touching with intent: using Therapeutic Touch. *Pediatr Nurs*. 1990;16(1):70-72.
16. Mersmann CA. *Therapeutic Touch and Milk Let Down in Mothers of Non-nursing Preterm Infants* [dissertation]. New York: New York University; 1993.
17. France NEM. The child's perception of the human energy field using Therapeutic Touch. *J Holistic Nurs*. 1993;11:319-331.
18. Meehan MTC. The Science of Unitary Human Beings and theory-based practice: Therapeutic Touch. In: Barrett EAM, ed. *Visions of Rogers' Science-Based Nursing*. New York, NY: National League for Nursing; 1990:67-81. Publication 15-2285.
19. Peters PJ. *The Lifestyle Changes of Selected Therapeutic Touch Practitioners: An Oral History* [dissertation]. Minneapolis, Minn: Walden University; 1992.
20. Boguslawski M. Therapeutic Touch: a facilitator of pain relief. *Top Clin Nurs*. 1980;2(1):27-37.
21. Satir F. Healing hands. *Olympian*. July 19, 1994.
22. Brown PR. *The Effects of Therapeutic Touch on Chemotherapy-induced Nausea and Vomiting: A Pilot Study* [master's thesis]. Reno: University of Nevada; 1981.
23. Sodergren KA. *The Effect of Absorption and Social Closeness on Responses to Educational and Relaxation Therapies in Patients With Anticipatory Nausea and Vomiting During Cancer Chemotherapy* [dissertation]. Minneapolis: University of Minnesota; 1993.
24. Dollar CE. *Effects of Therapeutic Touch on Perception of Pain and Physiological Measurements From Tension Headache in Adults: A Pilot Study* [master's thesis]. Jackson: University of Mississippi Medical Center; 1993.
25. Quinn JF. Holding sacred space: the nurse as healing environment. *Holistic Nurs Pract*. 1992;6(4):26-36.
26. Wirth DP. The effect of non-contact Therapeutic Touch on the healing rate of full thickness dermal wounds. *Subtle Energies*. 1990;1(1):1-20.
27. Woods DL. *The Effect of Therapeutic Touch on Disruptive Behaviors of Individuals With Dementia of the Alzheimer Type* [master's thesis]. Seattle: University of Washington; 1993.
28. Misra MM. *The Effects of Therapeutic Touch on Menstruation*. [master's thesis]. Long Beach: California State University; 1993.
29. Putnam ZE. The woman behind Therapeutic Touch: Dolores Krieger, PhD, RN. *Massage Ther J*. Fall 1995:50, 52.
30. Simington JA, Laing GP. Effects of Therapeutic Touch on anxiety in the institutionalized elderly. *Clin Nurs Res*. 1993;2:438-450.
31. Quinn JF. The Senior's Therapeutic Touch Education Program. *Holistic Nurs Pract*. 1992;7(1):32-37.
32. Krieger D. Therapeutic Touch: two decades of research, teaching and clinical practice. *Imprint*. 1990;37:83, 86-88.
33. Fiely D. Field of beams. *Columbus Dispatch*. August 20, 1995:1B-2B.
34. Calvert R. Dolores Krieger, PhD, and her Therapeutic Touch. *Massage Magazine*. 1994;47:56-60.
35. Mueller Jackson ME. The use of Therapeutic Touch in the nursing care of the terminally ill person. In: Borelli MD, Heidt PR, eds. *Therapeutic Touch: A Book of Readings*. New York, NY: Springer; 1981:72-79.
36. Brunjes CAF. Therapeutic Touch: a healing modality throughout life. *Top Clin Nurs*. 1983;5(2):72-79.
37. Messenger TC, Roberts KT. The terminally ill: serenity nursing interventions for hospice clients. *J Gerontol Nurs*. 1994;20(11):17-22.
38. Maxwell J. Nursing's new age? *Christianity Today*. 1996;40(3):96-99.
39. Kauffold MP. TT: healing or hokum? debate over "energy medicine" runs hot. *Chicago Tribune Nursing News*. November 19, 1995:1.
40. Keegan L. Holistic nursing. *J Post Anesth Nurs*. 1989;4(1):17-21.
41. Bullough VL, Bullough B. Therapeutic Touch: why do nurses believe? *Skeptical Inquirer*. 1993;17:169-174.
42. Dr Quinn studies Therapeutic Touch. *University of Colorado School of Nursing News*. May 1989:1.
43. Cabico LL. *A Phenomenological Study of the Experiences of Nurses Practicing Therapeutic Touch* [master's thesis]. Buffalo, NY: D'Youville College; 1992.
44. Rosa LA. When magic gets to play science. *Rocky Mountain Skeptic*. 1993;10(6):10-12.
45. Carpenito LJ, ed. *Nursing Diagnosis: Application to Clinical Practice*. 6th ed. Philadelphia, Pa: Lippincott; 1995:355-358.
46. Sandroff R. A skeptic's guide to Therapeutic Touch. *RN*. 1980;43(1):24-30, 82-83.
47. Raucheisen ML. Therapeutic Touch: maybe there's something to it after all. *RN*. 1984;47(12):49-51.
48. Haddad A. Acute care decisions: ethics in action. *RN*. 1994;57(11):21-22, 24.
49. Swackhamer AH. It's time to broaden our practice. *RN*. 1995;58(1):49-51.
50. Schmidt CM. The basics of Therapeutic Touch. *RN*. 1995;58(6):50, 52, 54.
51. Ledwith SP. Therapeutic Touch and mastectomy: a case study. *RN*. 1995;58(7):51-53.
52. Keegan L, Cerrato PL. Nurses are embracing holistic healing. *RN*. 1996;59(4):59.
53. Moccia P, ed. *New Approaches to Theory Development*. New York, NY: National League for Nursing; 1986:15-1992.
54. Barrett EAM, ed. *Visions of Rogers' Science-Based Nursing*. New York, NY: National League for Nursing; 1990:15-2285.
55. Moccia P. Letter to the editor. *Time*. 1994;144(24):18.
56. Krieger D. Therapeutic Touch: the imprimatur of nursing. *Am J Nurs*. 1975;75:784-787.
57. Krieger D, Peper E, Ancoli S. Therapeutic Touch: searching for evidence of physiological change. *Am J Nurs*. 1979;79:660-662.
58. Macrae JA. Therapeutic Touch in practice. *Am J Nurs*. 1979;79:664-665.
59. Quinn JF. One nurse's evolution as a healer. *Am J Nurs*. 1979;79:662-664.
60. Mackey RB. Discover the healing power of

- Therapeutic Touch. *Am J Nurs*. 1995;95(4):27-33.
61. Joel LA. Alternative solutions to health problems. *Am J Nurs*. 1995;95(7):7.
 62. Hover-Kramer D. Healing Touch certificate program continues to bring the human dimension to the nation's nurses. *Beginnings*. 1992;12(2):3.
 63. Cowens C, Monte T. *A Gift for Healing: How You Can Use Therapeutic Touch*. New York, NY: Crown Publishing Group; 1996.
 64. Krieger D. The response of in-vivo human hemoglobin to an active healing therapy by direct laying on of hands. *Human Dimensions*. Autumn 1972: 12-15.
 65. Krieger D. Therapeutic Touch and healing energies from the laying on of hands. *J Holistic Health*. 1975;1:23-30.
 66. Krieger D. Therapeutic Touch: an ancient, but unorthodox nursing intervention. *J N Y State Nurs Assoc*. 1975;6(2):6-10.
 67. Krieger D. Healing by the laying-on of hands as a facilitator of bio-energetic change: the response of in-vivo human hemoglobin. *Int J Psychoenergy Syst*. 1976;1(1):121-129.
 68. Krieger D. The relationship of touch, with intent to help or to heal, to subjects' in-vivo hemoglobin values: a study in personalized interaction. In: *Proceedings of the Ninth ANA Nurses Research Conference*. New York, NY: American Nurses' Association; 1973:39-59.
 69. Rogers ME. *An Introduction to the Theoretical Basis of Nursing*. Philadelphia, Pa: Davis; 1970.
 70. Karagulla S, Kunz D. *The Chakras and the Human Energy Field: Correlations Between Medical Science & Clairvoyant Observation*. Wheaton, Ill: Theosophical Publishing House; 1989.
 71. Randolph GL. The yin and yang of clinical practice. *Top Clin Nurs*. 1979;1(1):31-42.
 72. Brierton TD. Employers' New Age training programs fail to alter the consciousness of the EEOC. *Lab Law J*. 1992;43:411-420.
 73. Emery CE. Therapeutic Touch: healing technique or New Age rite? *Providence Sun Journal-Bulletin*. November 27, 1994:A1, A24.
 74. Knaster M, Dolores Krieger's Therapeutic Touch. *East/West*. 1989;19(8):54-57, 59, 79-80.
 75. Colorado State Board of Nursing. *Subcommittee to Investigate the Awarding of Continuing Education Units to Nurses for the Study of Therapeutic Touch and Other Non-traditional and Complementary Healing Modalities. Recommendations*. Denver: Colorado State Board of Nursing; 1992.
 76. Mulloney SS, Wells-Federman C. Therapeutic Touch: a healing modality. *J Cardiovascul Nurs*. 1996;10(3):27-49.
 77. Brown CC, Fischer R, Wagman AMI, Horrom N, Marks P. The EEG in meditation and Therapeutic Touch healing. *J Altered States Conscious*. 1977; 3:169-180.
 78. Quinn JF. Therapeutic Touch as energy exchange: testing the theory. *Adv Nurs Sci*. 1984;6(1): 42-49.
 79. Guerrero MA. *The Effects of Therapeutic Touch on State-Trait Anxiety Level of Oncology Patients* [master's thesis]. Galveston: University of Texas; 1985.
 80. Keller EAK, Bzdek VM. Effects of Therapeutic Touch on tension headache pain. *Nurs Res*. 1986;35 (2):101-106.
 81. Meehan MTC. Theory development. In: Barrett EAM, ed. *Visions of Rogers' Science-Based Nursing*. New York, NY: National League for Nursing; 1990:15-2285:197-207.
 82. Kramer NA. Comparison of Therapeutic Touch and Casual Touch in stress reduction of hospitalized children. *Pediatr Nurs*. 1990;16:483-485.
 83. Shuzman E. *The Effect of Trait Anxiety and Patient Expectation of Therapeutic Touch on the Reduction in State Anxiety in Preoperative Patients Who Receive Therapeutic Touch* [dissertation]. New York: New York University; 1993.
 84. Sies MM. *An Exploratory Study of Relaxation Response in Nurses Who Utilize Therapeutic Touch* [master's thesis]. East Lansing: Michigan State University; 1993.
 85. Wirth DP, Richardson JT, Eidelman WS, O'Malley AC. Full thickness dermal wounds treated with Therapeutic Touch: a replication and extension. *Complementary Ther Med*. 1993;1:127-132.
 86. Gagne D, Toye RC. The effects of Therapeutic Touch and relaxation therapy in reducing anxiety. *Arch Psych Nurs*. 1994;8:184-189.
 87. Schlotfeldt RM. Critique of: Krieger D. The relationship of touch, with intent to help or heal, to subjects' in-vivo hemoglobin values: a study in personalized interaction. In: *Proceedings of the Ninth ANA Nurses Research Conference*. New York, NY: American Nurses' Association; 1973:59-65.
 88. Walike BC, Bruno P, Donaldson S, et al. "... [A]ttempts to embellish a totally unscientific process with the aura of science..." *Am J Nurs*. 1975; 75:1275, 1278, 1292.
 89. Levine ME. "The science is spurious..." *Am J Nurs*. 1979;79:1379-1380.
 90. Clark PE, Clark MJ. Therapeutic Touch: is there a scientific basis for the practice? *Nurs Res*. 1984; 33(1):38-41.
 91. Meehan MTC. Therapeutic Touch. In: Bulechek GM, McCloskey JC, eds. *Nursing Interventions: Essential Nursing Treatments*. 2nd ed. Philadelphia, Pa: Saunders; 1992:201-212.
 92. Fish S. Therapeutic Touch: can we trust the data? *J Christian Nurs*. 1993;10(3):6-8.
 93. Meehan MTC. Therapeutic Touch and postoperative pain: a Rogerian research study. *Nurs Sci Q* 1993;6(2):69-78.
 94. Bandman EL, Bandman B. *Critical Thinking in Nursing*. Norwalk, Conn: Appleton & Lange; 1995.
 95. Meehan MTC. Quackery and pseudo-science. *Am J Nurs*. 1995;75(7):17.
 96. Meehan MTC. ... And still more on TT. *Res Nurs Health*. 1995;18:471-472.
 97. Rosa LA. *Survey of Therapeutic Touch "Research"*. Loveland, Colo: Front Range Skeptics; 1996.
 98. Tharnstrom CAL. *The Effects of Non-contact Therapeutic Touch on the Parasympathetic Nervous System as Evidenced by Superficial Skin Temperature and Perceived Stress* [master's thesis]. San Jose, Calif: San Jose State University; 1993.
 99. Parkes BS. *Therapeutic Touch as an Intervention to Reduce Anxiety in Elderly Hospitalized Patients* [dissertation]. Austin: University of Texas; 1985.
 100. Mueller Hinze ML. *The Effects of Therapeutic Touch and Acupressure on Experimentally-Induced Pain* [dissertation]. Austin: University of Texas; 1988.
 101. Bowers DP. *The Effects of Therapeutic Touch on State Anxiety and Physiological Measurements in Preoperative Clients* [master's thesis]. San Jose, Calif: San Jose State University, 1992.
 102. Olson M, Sneed NV. Anxiety and Therapeutic Touch. *Issues Ment Health Nurs*. 1995;16:97-108.
 103. Fedoruk RB. *Transfer of the Relaxation Response: Therapeutic Touch as a Method for Reduction of Stress in Premature Neonates* [dissertation]. Baltimore: University of Maryland; 1984.
 104. Hogg PK. *The Effects of Acupressure on the Psychological and Physiological Rehabilitation of the Stroke Patient* [dissertation]. Alameda: California School of Professional Psychology; 1985.
 105. Snyder M, Egan EC, Burns KR. Interventions for decreasing agitation behaviors in persons with dementia. *J Gerontol Nurs*. 1995;21(7):34-40, 54-55.
 106. Schweitzer SF. *The Effects of Therapeutic Touch on Short-term Memory Recall in the Aging Population: A Pilot Study* [master's thesis]. Reno: University of Nevada; 1980.
 107. Randolph GL. Therapeutic and physical touch: physiological response to stressful stimuli. *Nurs Res*. 1984;33(1):33-36.
 108. Nodine JL. *The Effects of Therapeutic Touch on Anxiety and Well-being in Third Trimester Pregnant Women* [master's thesis]. Tucson: University of Arizona; 1987.
 109. Post NW. *The Effects of Therapeutic Touch on Muscle Tone* [master's thesis]. San Jose, Calif: San Jose State University; 1990.
 110. Straneva JAE. *Therapeutic Touch and In Vitro Erythrocytosis* [dissertation]. Bloomington: Indiana University; 1992.
 111. Bush AM, Geist CR. Testing electromagnetic explanations for a possible psychokinetic effect of Therapeutic Touch in germinating corn seed. *Psychology Rep*. 1992;70:891-896.
 112. Edge H. The effect of laying on of hands on an enzyme: an attempted replication. Paper presented at: 22nd Annual Convention of the Parapsychology Association; August 15-18, 1979; Moraga, Calif.
 113. Meehan MTC. *The Effect of Therapeutic Touch on the Experience of Acute Pain in Postoperative Patients* [dissertation]. New York: New York University; 1985.
 114. Hale EH. *A Study of the Relationship Between Therapeutic Touch and the Anxiety Levels of Hospitalized Adults* [dissertation]. Denton: Texas Women's University; 1986.
 115. Quinn JF. Therapeutic Touch as energy exchange: replication and extension. *Nurs Sci Q*. 1989; 2(2):79-87.
 116. Claman HN, Freeman R, Quissel D, et al. *Report of the Chancellor's Committee on Therapeutic Touch*. Denver: University of Colorado Health Sciences Center; 1994.
 117. Butgereit B. Therapeutic Touch: UAB to study controversial treatment for Pentagon. *Birmingham News*. November 17, 1994:1A, 10A.
 118. Turner JG. *Tri-Service Nursing Research Grant Proposal* [revised abstract]. 1994. Grant No. MDA905-94-Z-0080.
 119. Turner JG. *The Effect of Therapeutic Touch on Pain & Anxiety in Burn Patients* [grant final report]. Tri-Service Nursing Research Program; November 14, 1996. Grant No. N94020.
 120. Lionberger HJ. Therapeutic Touch: a healing modality or a caring strategy. In: Chinn PL, ed. *Nursing Research Methodology: Issues and Implementation*. Rockville, Md: Aspen Publishers; 1986: 169-180.
 121. Lionberger HJ. *An Interpretive Study of Nurses' Practice of Therapeutic Touch* [dissertation]. San Francisco: University of California; 1985.
 122. Polk SH. *Client's Perceptions of Experiences Following the Intervention Modality of Therapeutic Touch* [master's thesis]. Tempe: Arizona State University; 1985.
 123. Hamilton-Wyatt GK. *Therapeutic Touch: Promoting and Assessing Conceptual Change Among Health Care Professionals* [dissertation]. East Lansing: Michigan State University, 1988.
 124. Heidt PR. Openness: a qualitative analysis of nurses' and patients' experiences of Therapeutic Touch. *Image J Nurs Sch*. 1990;22:180-186.
 125. Thomas-Beckett JG. *Attitudes Toward Therapeutic Touch: A Pilot Study of Women With Breast Cancer* [master's thesis]. East Lansing: Michigan State University; 1991.
 126. Clark AJ, Seifert P. Client perceptions of Therapeutic Touch. Paper presented at: Third Annual West Alabama Conference on Clinical Nursing Research; 1992.
 127. Samarel N. The experience of receiving Therapeutic Touch. *J Adv Nurs*. 1992;17:651-657.
 128. Hughes PP. *The Experience of Therapeutic Touch as a Treatment Modality With Adolescent Psychiatric Patients* [master's thesis]. Albuquerque: University of New Mexico; 1994.
 129. James Randi Educational Foundation. Available at: <http://www.randi.org>. Accessed March 15, 1997.