ORIGINAL RESEARCH

THE EFFICACY OF HEALING TOUCH IN CORONARY ARTERY BYPASS SURGERY RECOVERY: A RANDOMIZED CLINICAL TRIAL

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Context • The use of complementary therapies in conjunction with conventional care has great potential to address patient pain, complication rates, and recovery time. Few studies of such therapies have been conducted in hospital settings where some of the most stressful procedures are performed on a regular basis.
Objective • We hypothesized that patients receiving healing touch (HT) would see improved outcomes.
Design • Patients were randomized into 1 of 3 treatment groups: no intervention, partial intervention (visitors), and an HT group.
Setting • This study was conducted in an acute-care hospital in a large metropolitan area.
Patients or Other Participants • Patients undergoing first-time elective coronary artery bypass surgery were invited to participate. There were 237 study subjects.
Intervention • HT is an energy-based therapeutic approach to healing that arose out of nursing in the early 1980s. HT aids relaxation and supports the body's natural healing process.
Main Outcome Measures • This study consisted of 6 outcome measures: postoperative length of stay, incidence of postoperative atrial fibrillation, use of anti-emetic medication, amount of narcotic pain medication, functional status, and anxiety.
Results • Analysis was conducted for all patients and separately by inpatient/outpatient status. Though no significant decrease in the use of pain medication, anti-emetic medication, or incidence of atrial fibrillation was observed, significant differences were noted in anxiety scores and length of stay. All HT patients showed a greater decrease in anxiety scores when compared to the visitor and control groups. In addition, there was a significant difference in outpatient HT length of stay when compared to the visitor and control groups. (*Altern Ther Health Med*. 2008;14(4):24-32.)

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Each year in the United States, approximately 600 000 coronary artery bypass graft surgeries are performed, with costs totaling $25.3 billion.[1] According to the American College of Cardiology and the American Heart Association Task Force on Practice Guidelines, coronary artery bypass (CAB) surgery is among the most common operations performed in the world and accounts for more resources expended in cardiovascular medicine than any other single procedure.[1] The total cost of this intervention clearly is compounded when complications occur. In addition, dramatic changes in an individual's lifestyle and social activities often are observed following surgery.[2]

Healing touch (HT) is a biofield- or energy-based therapy that arose out of nursing in the early 1980s.[3] In 1989, the American Holistic Nurses Association (AHNA) offered HT as a continuing education program, and in 1996 it became an endorsed program for AHNA through Healing Touch International, Inc. The HT curriculum is taught as a multi-level program with a 1-year mentorship experience that leads to certification.[3] HT complements conventional healthcare and is used in collaboration with other approaches to health and healing.

HT aids relaxation and supports the body's natural healing process, ie, one's ability to self-balance and self-heal. This noninvasive technique involves (1) intention (such as the practitioner centering with the deep, gentle, conscious breath) and (2) placement of hands in specific patterns or sequences either on the body or above it. At its core, the theoretical basis of the work is that a human being is a multi-dimensional energy system (including consciousness) that can be affected by another to promote well-being. There are a variety of theorists whose work supports this notion. For example, nursing theorist Dr Jean Watson developed Watson's transpersonal-caring model theory. This theory includes an expanded view of the individual to one composed of

spirit, a universal mind, and consciousness as energy.[4] Research today on subtle info-energetic connections is being conducted at Princeton University within the Princeton Engineering Anomalies Research Program. These connections indicate that actions in one system can potentially influence actions of another on a quantum energetic level.[5] According to Oschman, modern research has confirmed work done by pioneers in energy fieldwork in the 1930s such as Dr Harold Saxton Burr of Yale: "Not only does every event in the body, either normal or pathological, produce electrical changes, it also produces alterations of the magnetic fields in the spaces around the body."[6(p18)] Candace Pert, PhD, neuroscientist and pharmacologist, is best known for her discovery of opiate receptors and endorphins and peptide research. Her groundbreaking work spans several decades of research in molecular biology. Her striking conclusion is that one's emotions and their biological components ("bodymind") function as an integrated information network that offers a new understanding of the power of a person's thoughts and feelings to affect health and well-being.[7]

Pert's discoveries also have served to create bridges among such distinct disciplines as psychology, neurophysiology, immunology, and endocrinology, helping to usher in a new era of integrative medicine, uniting links between not only mind and body, but Eastern and Western traditions as well.

The holistic nursing paradigm with its concept of energetic healing has been emerging concurrently with advances in supportive research in mind-body medicine, as well as consumers' interest in complementary and alternative medicine (CAM).[8] Many of the observations of energy practitioners that scientists previously found unacceptable are beginning to be explored by researchers.[9] Increased application of HT in healthcare has come about in large part because of the interest of its practitioners and patients' response. In the United States alone, more than 75 000 people have taken at least a first-level HT course, and it is taught in a variety of countries worldwide.[10] HT is being used in such diverse areas as outpatient pain centers, private practices, and operating rooms.[11]

Although there is a growing body of literature exploring the increasing patient interest in complementary therapies[12,13] and an increasing amount involving cardiovascular patients,[14] few studies specifically apply the energy therapy known as HT to the acute-care setting.[15] A review of the literature shows that until recently, little attention had been paid to studies of HT in particular as a basis for either evaluating outcomes or determining needed directions in research and clinical practice. In an article published in 2004, Diane Wardell identified more than 30 quantitative studies conducted with HT as the independent variable.[11] Wardell notes that a key aspect of this review was to include non-significant statistical findings, noting that the question has been raised whether the field of energy research readily lends itself to traditional scientific analysis due to coexisting paradoxical findings.[16]

The literature review done for the purpose of this paper revealed that few published studies demonstrate HT specifically as an effective energy therapy beyond case studies, anecdotal reports, and investigations with small sample sizes. However, several randomized controlled studies using HT were identified, all of which have taken place within the past 5 to 6 years.

In a 2-arm, single-blind randomized controlled trial, Cook et al studied 78 (of 234 initially screened) women receiving radiation therapy for gynecological or breast cancer. Participants received either HT (provided by level-II HT practitioners) or a mock treatment (laypeople with no previous training or knowledge of HT). Each patient received 6 sessions of 30 minutes each following radiation treatments. Study subjects who received HT demonstrated better health-related quality of life. Statistically significant differences were seen between the 2 groups in SF-36 scores in categories of vitality ($P<.03$), pain ($P<.02$), and physical function ($P<.05$).[17]

Post-White et al used a randomized, prospective, 2-period crossover design to measure HT, presence, and therapeutic massage on symptom relief in 164 outpatients undergoing chemotherapy. Noted outcomes were decreased blood pressure, decreased pain, improved mood, and improved fatigue.[18]

Ziembroski et al used 2 HT techniques to determine their effects on the quality of life for individuals at the end stage of life. In this experimental design, 55 participants were randomized into standard care and HT groups. Study outcomes examined were quality of life, physical symptoms, and spiritual meaning. No significant differences were found between the 2 small groups (standard care, n=26; HT, n=29).[19]

A study by Wilkinson examining the clinical effectiveness of HT noted raised sigA concentrations in patients receiving this therapy, as well as lowered stress perceptions and relief of pain. This small study randomized 22 participants to no treatment, standard HT, and HT plus music. The results indicated a significant interaction effect of the treatment stage and the practitioner training level ($P<.021$), with a nearly 4 times average positive change for those participants with the more highly trained practitioner.[20]

The MANTRA study,[21] a pilot study at Duke University, used a randomized controlled design that focused on the association of HT and other "noetic" therapies such as prayer and relaxation training prior to angioplasty. The study found a 25% to 30% decrease in adverse outcomes associated with HT, which served as the basis for a 2-tiered 748-patient study further examining adverse patient outcomes (adverse cardiac events and death). Although music, imagery, and touch (MIT) therapies were shown to lower mortality at 6 months post-procedure, no significant difference was found for the primary composite endpoint in any treatment comparison. The primary endpoint was described as "combined in-hospital major adverse cardiovascular events and 6-month readmission or death."[22(p147)]

For the purposes of this study on CAB patients, there was particular interest in research that addresses the hospitalized patient, as the cardiac-surgical bypass patient is a specialized subset of the acute care setting. As such, the needs of CAB patients as a group are similar to those of other hospitalized patients, yet unique as well. Two of the most common problems associated with care of the patient who has undergone cardiac

surgery have to deal with pain management[23] and heart arrhythmias.[24] These are key care management issues because of the associated stress and discomfort experienced by patients, which increases length of stay and impact on overall recovery.[25]

The use of CAM in conjunction with conventional care has great potential to address patient pain, complication rates, and recovery time. Although the usage of CAM by the general US population is steadily increasing,[12] the impact of these treatments has not been studied by means typically acceptable to Western practitioners. Even fewer studies have been conducted in hospital settings where some of the most stressful procedures are performed on a regular basis.

We hypothesized that patients receiving HT would see improved outcomes, including decreases in length of stay, medication use, and complication rates, with improved health status and anxiety scores.

METHODS

Participants

An experimental randomized controlled trial was conducted between September 1999 and November 2002. All consecutive patients who chose to undergo first-time elective CAB were invited to participate in the study at St Joseph's Hospital, a community hospital in St Paul, Minnesota. Initially, only scheduled outpatients were included in the study. In May 2000, non-emergent inpatients were added to the recruitment process to speed enrollment. Excluded were (1) valve or minimally invasive direct CAB patients, (2) patients who had a history of CAB surgery, (3) patients who were not competent to answer the study questionnaires, and (4) emergent CAB patients. Final enrollment consisted of 120 inpatients and 117 outpatients.

This research was approved and annually reviewed by the house institutional review board. Written consent was obtained from all patients on the preoperative education day.

Interventions

Upon entering the study, participants were randomly assigned to 1 of 3 study groups: full intervention or HT group, partial intervention or "visitor" group, or a control group receiving no additional intervention. All 3 groups received the same standard of care from the hospital staff. In addition to standard care, the HT group received preoperative education for HT and received 3 HT interventions—the day before surgery, immediately prior to surgery, and the day after surgery. Two certified HT practitioners, both registered nurses, provided all the HT sessions.

HT sessions were in accordance with standard HT practice,[26] in which the practitioner establishes a relationship with the patient. After conversing with the patients and assessing their energy fields, the practitioners performed a variety of HT techniques based upon their assessment.[27] Each patient in the HT group had the same practitioner throughout his or her hospital stay. Treatments ranged from 20 to 60 minutes in duration, with the exception of session 2, which occurred on the day of surgery and lasted 60 to 90 minutes. Sessions were generally conducted with the patient supine on a treatment table or bed and included techniques that were done either directly on the body (light touch) or above the body.

The visitor group was designed to control the presence effect associated with the visit of the HT practitioners. Patients in the visitor group received a visit by the same retired registered nurse on 3 occasions. These followed the same schedule as the HT interventions (day before surgery, immediately before surgery, and day after surgery). The first and third visits were 20 to 60 minutes in duration, and the second visit (day of surgery) lasted 60 to 90 minutes. Some visits were shortened at the patient's request. The visit consisted of general conversation or the visitor remaining quietly in the room with the patient. At the commencement of the study, training was given to the volunteer visitors to standardize the content of the conversation.

The control group received the standard CAB surgery protocol with neither HT nor a volunteer visit.

Objectives

We hypothesized that patients receiving HT would see improved outcomes, including decreased length of stay, medication use, incidence of atrial fibrillation, and improved health status and anxiety scores.

OUTCOMES

This study consisted of 6 outcome measures: postoperative length of stay, incidence of postoperative atrial fibrillation, use of anti-emetic medication, amount of narcotic pain medication, functional status, and anxiety. In order to make narcotic pain medications comparable, all were converted to morphine-equivalent dosage.[27,28] Medications were dispensed based on standing orders and as determined by patient need or nurse assessment.

Patients were discharged when the following criteria were met:

- vital signs stable and within normal limits per patient baseline;
- pain adequately controlled with oral analgesics;
- heart rhythm stable;
- adequate calories consumed;
- weight near baseline;
- untreated significant pulmonary disease not present; and
- appropriate semi-independence in activities of daily living and level of activity.

Atrial fibrillation is assessed by continuous cardiac monitoring during the hospital stay; nurses identify any changes in heart rhythm, document the changes, and notify the physician. Patients with a history of atrial fibrillation or currently taking beta blockers for any reason were excluded from the analysis comparing incidence of atrial fibrillation among the study groups.

Anxiety was measured using the State Trait Anxiety Inventory (STAI),[29] a widely accepted 40-item tool measuring both temporary and dispositional anxiety in adults. The STAI was administered on the preoperative education day in the hospital Surgical Admit Unit and postoperative day 4 by a cardiac rehab nurse. Functional status was measured using the Health

Status Questionnaire (SF-12), a 12-item measure of general health that is recognized for its validity and reliability.[30] The questionnaire was given twice during the study period: on the preoperative education day and by mail to all participants 6 months after their surgery. Patients who did not respond to the initial survey were called by trained research staff members who administered the survey by phone.

Additional data collected from medical records included demographics (gender, age, type of admission) and baseline clinical characteristics (height, weight, history of myocardial infarction, history of arrhythmias, comorbidities, APR-DRG [All Patient Refined Diagnosis Related Groups] severity). Comorbidities included hypertension, congestive heart failure (CHF), hypercholesterolemia, chronic obstructive pulmonary disease (COPD), depression, and diabetes.

Sample Size

It was determined that in order to detect a minimum change of 0.5 days in length of stay, a total sample size of 402 patients was needed: 134 patients per group was targeted to achieve statistical power of 0.8 with a standard deviation of 4 and a type I error rate of 0.05 (2-sided). Data collection was ended before the enrollment goal was reached due to recruitment difficulties, impending changes to care protocols, and an interim analysis that suggested additional enrollment was unlikely to yield any more statistically significant findings. The final sample size was 237.

Randomization

A total of 601 patients were assessed for eligibility to participate in the study; of those, 163 did not meet the inclusion criteria, 123 declined to participate, and 25 had insufficient time between the eligibility assessment and scheduled surgery.

Patients were randomly assigned to the HT group, the visitor group, or the control group (99, 94, and 97 patients, respectively). The randomization schedule was generated by a hospital statistician using SPSS Version 13.0 (SPSS, Inc, Chicago). Outpatients were enrolled by staff members in the surgeon's office and inpatients by health unit coordinators of the telemetry unit in the hospital. Patients were assigned to a study group at the time of enrollment. Allocation was done in blocks of 6. Upon enrollment into the study, a sealed, sequentially numbered envelope was opened to reveal study group assignment. To reduce potential of bias from 2 differing patient populations, the nonemergent inpatients and the scheduled outpatients were treated as 2 different groups with separate randomization schedules. Patients who died during their hospital stay were excluded from the study and categorized as lost to follow-up.

Blinding

Because of the nature of HT and the required patient-practitioner interaction, it was not feasible to blind the study for either practitioners or participants, in part due to the logistics necessary for preoperative procedures (arterial and central line placement, etc) in the operating room prior to CAB surgery.

Statistical Methods

Descriptive statistics were computed for all variables (Table 1). Continuous outcome variables (length of stay, amount of narcotic pain medications, functional status, and anxiety) were analyzed using analysis of covariance (ANCOVA). Total morphine or morphine equivalent was calculated for each patient on days 1 and 2 postoperatively.[27,28] SF-12 and anxiety scores were measured pre- and post-intervention; the change from pre- to post- was used for analysis rather than the raw scores. For categorical outcome variables (length of stay ≤6 days, incidence of postoperative atrial fibrillation, use of anti-emetic medication, and dichotomized postoperative length of stay ≤6 days), logistic regression models were applied.

Fifteen variables were included in the analysis model for adjustment: APR-DRG, severity, hypertension, CHF, hypercholesterolemia, COPD, depression, diabetes, gender, age, admission status, history of MI, baseline anxiety, baseline SF-12, physical and mental scales. To determine if there were significant interactions between physical and mental status, the interaction with corresponding marginal factors was considered in the models.

Analysis was conducted for all patients, as well as separately by inpatient/outpatient status. Residual plots (not shown) for all models were performed to diagnose model fit and to check all the assumptions of ANCOVA and logistics regression.

A P value of <.05 was considered to be statistically significant. P value was not adjusted for multiple tests. All analyses were done through SPSS Version 13.0 by SPSS, Inc.

RESULTS

Patient recruitment began in September 1999, and the study was closed in November 2002. Patient follow-up continued through June 2003.

Two hundred thirty-seven patients completed the study. There were 87 patients in the HT group, 87 in the control group, and 63 in the visitor group; baseline characteristics are shown in Table 1. As shown in Table 1, the 3 study groups were not significantly different from each other at baseline, except for preoperative anxiety scores (HT=41, visitor=41, and control=45, P=.04). Average age was 64 years in the HT and control groups and 66 years in the visitor group. For all CAB patients seen during the same time period, average age was comparable at 64 years. The percentage of females in the HT group was 79.3%, 77% in the control group, and 74.6% in the visitor group. The CAB population in the hospital during the same time frame was 23.1% female.

A logarithm transformation for length of stay was used to handle the skewness of the raw data (Figure 1). The adjusted mean length of stay for the HT group was 6.9 (95% CI=6.1, 7.7) days, which was less than that of the visitor group (7.7 days, 95% CI=6.7, 8.7) and the control group (7.2 days, 95% CI=6.4, 8.1). The difference in mean length of stay was statistically significant (P=.04). Compared with the control group, patients in the HT group had a 120% greater chance of having a length of stay ≤6 days (odds ratio [OR]=2.2, 95% CI=0.9, 7.5). Compared with the visitor group, the chance of such a stay is 280% greater (OR=3.8,

TABLE 1 Simple Comparison of 3 Study Groups*

		Healing Touch n=87	Visitor n=63	Control n=87	Total n=237	*P* value
Continuous Variables				**Mean (SD)**		
Length of stay (days)		5.8 (1.9)	6.5 (2.6)	6.0 (1.7)	6.0 (2.2)	0.15
Preoperative anxiety		41 (11)	41 (13)	45 (13)	43 (12)	0.04
Preoperative physical function (SF-12)		40 (11)	40 (9)	37 (8)	39 (10)	0.31
Preoperative mental function (SF-12)		50 (9)	49 (10)	49 (11)	49 (10)	0.69
Morphine equivalent for day 1 and day 2		26 (15)	26 (13)	25 (13)	25 (14)	0.65
Categorical Variables				**Counts (%)**		
Length of stay ≤ 6 days		68 (78)	39 (62)	61 (70)	68 (71)	0.10
Incidence of postoperative atrial fibrillation		19 (22)	15 (24)	26 (30)	60 (25)	0.45
Patients using anti-emetic medication		24 (28)	17 (27)	27 (31)	68 (29)	0.83
Hypertension		48 (55)	38 (60)	58 (67)	144 (61)	0.30
Congestive heart failure		9 (10)	4 (6)	11 (13)	24 (10)	0.45
Cholesterol		69 (79)	49 (78)	66 (76)	184 (78)	0.86
Chronic obstructive pulmonary disease		7 (8)	1 (2)	5 (6)	13 (5)	0.23
Depression		5 (6)	4 (6)	5 (6)	14 (6)	0.99
Diabetes		28 (32)	18 (29)	35 (40)	81 (34)	0.29
Smoking		20 (23)	12 (19)	16 (18)	48 (20)	0.72
Age group (years)	<55	18 (21)	7 (11)	19 (22)	44 (19)	0.13
	55-64	24 (28)	23 (37)	31 (36)	78 (33)	
	65-74	31 (36)	27 (43)	21 (24)	79 (33)	
	>75	14 (16)	6 (10)	16 (18)	36 (15)	
Myocardial infarction	No	50 (57)	37 (59)	52 (60)	139 (59)	0.98
	Not recent	21 (24)	16 (25)	22 (25)	59 (25)	
	Recent	16 (18)	10 (16)	13 (15)	39 (16)	
Female		69 (79)	47 (75)	67 (77)	183 (77)	0.79
Outpatients		42 (48)	35 (56)	40 (46)	117 (49)	0.50
Body mass index class	Normal	20 (23)	18 (30)	21 (24)	59 (25)	0.92
	Overweight	30 (34)	19 (30)	31 (36)	80 (34)	
	Obese	37 (43)	25 (40)	35 (40)	97 (41)	
History of atrial fibrillation		19 (22)	15 (24)	26 (30)	60 (25)	0.45
Severity	1	7 (8)	5 (8)	5 (6)	17 (7)	0.88
	2	55 (63)	35 (56)	55 (63)	145 (61)	
	3	20 (23)	20 (32)	24 (28)	64 (27)	
	4	5 (6)	3 (5)	3 (3)	11 (5)	
History of myocardial infarction		36 (41)	24 (38)	32 (37)	92 (39)	0.82
Number of grafts	1	5 (6)	2 (3)	3 (3)	10 (4)	0.71
	2	22 (25)	18 (29)	27 (31)	67 (28)	
	3	43 (49)	26 (41)	33 (38)	102 (43)	
	4	15 (17)	15 (24)	22 (25)	52 (22)	
	5	2 (2)	2 (3)	1 (1)	5 (2)	
	6	0 (0)	0 (0)	1 (1)	1 (0.4)	

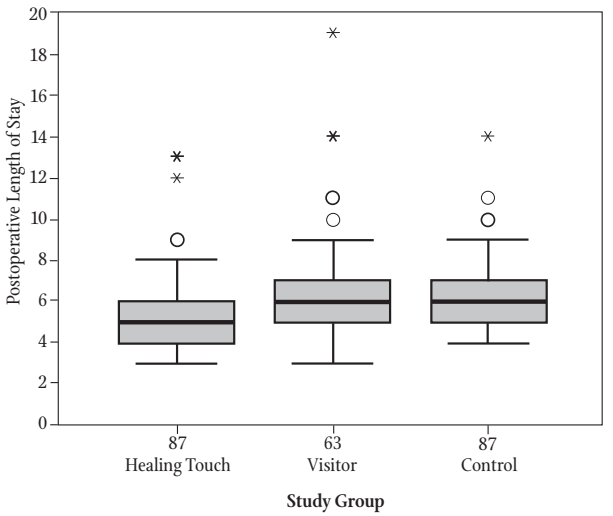

FIGURE 1 Length of Stay (in Days) by Study Group

95% CI=1.5, 9.5). The difference among the 3 groups was statistically significant (*P*=.01).

The mean decreases in anxiety scores from pre- to postoperative for the 3 treatment groups were 6.3 (HT: 95% CI=2.0, 10.6), 5.8 (visitor: 95% CI=0.9, 10.8), and 1.8 (control: 95% CI=-2.6, 6.2, *P*=.01). No significant differences were detected between the 3 treatment groups for the remaining outcome variables (amount of narcotic pain medication usage, change of physical functional status, change of mental functional status, incidence of postoperative atrial fibrillation, and patients using anti-emetic medication). The estimated means of the amount of narcotic pain medication used were 46.7 (95% CI=32.1, 61.2), 46.1 (31.1, 61.2), and 45.6 (31.7, 59.6) for HT, visitor, and control group, respectively. For the change of physical functional status, they were -1.3 (-6.1, 3.6), -0.9 (-6.1, 4.3), and -0.6 (-5.6, 4.4). Finally, for the change of mental functional status, the estimated means were 0.8 (-3.0, 4.7), 1.7 (-2.3, 5.8), and 2.3 (-1.7, 6.3). The results for all patients are presented in Table 2.

In subgroup (outpatients and inpatients) analyses, there was a significant difference in length of stay for outpatients (*P*=.01). The mean length of stay of outpatients for the HT group was 6.6 days (95% CI=5.2-7.5), 7.4 (95% CI=6.0-9.0) for the visitor group, and 7.7 (95% CI=6.0-8.6) for the control group. The same trend was observed in the dichotomized length of stay (OR for HT vs control=14.3, 95% CI=2.1-30.9; OR for HT vs visitor=23.8, 95% CI=3.6-166.7; overall *P* value=.04) (Table 3). For inpatients, no significant difference was found (Table 4). All analyses revealed no statistically significant interaction between covariates for both subgroups.

No adverse event or side effect related to HT was reported in any study group.

DISCUSSION

It was hypothesized that a decrease in the incidence of atrial fibrillation, anxiety levels, and use of medications for pain and nausea would be seen among patients receiving the HT intervention. It was also hypothesized that a decreased length of stay would be observed. Furthermore, it was anticipated that the visitor group would have a higher percentage of desirable outcomes than the control group yet fewer than the HT group.

While no significant decrease in the use of pain medication or anti-emetic medication or in the incidence of atrial fibrillation was observed, significant differences were noted in anxiety scores and length of stay. All HT patients showed a greater decrease in anxiety scores when compared to the visitor and control groups (HT=6.3, visitor=5.8, control=1.8; *P*=.01). In addition, there was a significant difference in outpatient HT length of stay when compared to the visitor and control groups (HT=6.2, visitor=7.3, control=7.2; *P*=.01).

Although there was a significant decrease in anxiety scores for HT patients, there is anecdotal evidence that a different

TABLE 2 Results for All Patients

Continuous Outcomes	HT		Visitor		Control		
	Mean	CI	Mean	CI	Mean	CI	*P* value
Length of stay (days)	6.9	(6.1, 7.7)	7.7	(6.7, 8.7)	7.2	(6.4, 8.1)	0.04
Narcotic pain medications (mg)	46.7	(32.1, 61.2)	46.1	(31.1, 61.2)	45.6	(31.7, 59.6)	0.97
Change of anxiety	6.3	(2.0, 10.6)	5.8	(0.9, 10.8)	1.8	(-2.6, 6.2)	0.01
Change of physical functional status	-1.3	(-6.1, 3.6)	-0.9	(-6.1, 4.3)	-0.6	(-5.6, 4.4)	0.90
Change of mental functional status	0.8	(-3.0, 4.7)	1.7	(-2.3, 5.8)	2.3	(-1.7, 6.3)	0.59

Categorical outcomes	HT vs Control		HT vs Visitor		
	OR	CI	OR	CI	*P* value
Length of stay ≤ 6 days	2.2	(0.9, 5.3)	3.8	(1.5, 9.5)	0.02
Incidence of postoperative atrial fibrillation	0.7	(0.3, 1.8)	1.0	(0.4, 2.5)	0.79
Patients using anti-emetic medication	1.1	(0.5, 2.4)	1.1	(0.5, 2.1)	0.97

TABLE 3 Results for Outpatients

Continuous Outcomes	HT		Visitor		Control		
	Mean	CI	Mean	CI	Mean	CI	*P* value
Length of stay (days)	6.2	(5.2, 7.5)	7.3	(6.0, 9.0)	7.2	(6.0, 8.6)	0.01
Narcotic pain medications (mg)	51.8	(35.8, 67.8)	56.7	(39.7, 73.7)	49.5	(34.3, 64.7)	0.65
Change of anxiety	4.7	(-2.0, 11.5)	5.0	(-2.3, 12.3)	1.8	(-5.1, 8.7)	0.32
Change of physical functional status	-3.9	(-10.4, 2.7)	-4.1	(-11.3, 3.1)	-4.1	(-11.2, 3.0)	0.99
Change of mental functional status	3.8	(-2.4, 10.1)	4.0	(-2.8, 10.8)	4.8	(-2.0, 11.6)	0.90

Categorical Outcomes	HT vs Control		HT vs Visitor		
	OR	CI	OR	CI	*P* value
Length of stay ≤ 6 days	14.3	(2.1, 30.9)	23.8	(3.6, 166.7)	0.04
Incidence of postoperative atrial fibrillation	0.6	(0.2, 2.2)	1.6	(0.4, 6.5)	0.37
Patients using anti-emetic medication	1.5	(0.50, 4.4)	2.0	(0.7, 5.6)	0.40

methodology may have shown an even greater difference. Study patients seemed to underreport their anxiety on questionnaires administered before treatment. After experiencing their HT session, these patients commented to their HT practitioner on how unaware they had been of their stress until experiencing deep relaxation.

We saw significantly improved length of stay in the HT group when compared to the other study groups, and although not significant, there were positive changes in the other outcome measures. Particularly interesting is the incidence of atrial fibrillation. Atrial fibrillation is a well-recognized postoperative complication typically resulting in additional treatment that lengthens hospital stay. We hypothesized that a decreased incidence of atrial fibrillation in study participants postoperatively would be critical in decreasing length of stay. Although the difference was not statistically significant, the incidence of atrial fibrillation was higher in the control group than in the HT group or the visitor group (HT=22%, visitor=24%, control=30%).

Although the exact mechanism remains unknown, at the very least, an improved patient care experience may be a result of HT therapy. Since ancient times, many cultures have recognized "life energy" or "bio-energy," and in recent history, the interdisciplinary field of psychoneuroimmunology has emerged. Emotions and beliefs can create physical changes in the body.[31] HT, by its own definition, is intended to be used alongside conventional care, not as a substitute for it.

Limitations

Pain and nausea are difficult to quantify. Postoperative protocol calls for scheduled administration of medications that is not dependent on patient symptoms. In addition, dosage and frequency depend to some extent on the judgment of the caregivers rather than an objective pain or nausea measurement. The same level of pain or nausea for the same patient may be treated differently depending on the individual who is administering care.

Given the nature of the treatment, it is very difficult to blind

TABLE 4 Results for Inpatients

Continuous Outcomes	HT		Visitor		Control		
	Mean	CI	Mean	CI	Mean	CI	*P* value
Length of stay (days)	7.4	(6.2, 8.8)	7.7	(6.3, 9.2)	6.8	(5.8, 8.1)	0.26
Narcotic pain medications (mg)	49.8	(34.2, 65.4)	41.7	(25.1, 58.4)	50.5	(35.6, 65.5)	0.36
Change of anxiety	8.2	(1.3, 15.1)	7.8	(0.2, 15.5)	3.3	(-3.0, 9.5)	0.10
Change of physical functional status	-0.5	(-6.4, 6.3)	0.8	(-6.2, 7.8)	0.7	(-5.1, 6.5)	0.92
Change of mental functional status	-3.2	(-8.6, 2.2)	-0.9	(-6.8, 5.0)	-1.0	(-5.9, 4.0)	0.39

Categorical Outcomes	HT vs Control		HT vs Visitor		
	OR	CI	OR	CI	*P* value
Length of stay ≤ 6 days	1.0	(0.3, 3.1)	1.26	(0.4, 4.5)	0.92
Incidence of postoperative atrial fibrillation	1.3	(0.3, 5.4)	0.6	(0.1, 3.0)	0.69
Patients using anti-emetic medication	0.9	(0.3, 2.5)	0.6	(0.2, 1.5)	0.57

an HT treatment, and we had ethical concerns about doing so. Other studies have used mock HT,[32,33] where practitioners perform the hand motions but think non-healing thoughts (eg, perform math problems). It seemed unethical, especially given the stressful nature of an operating room for both patients and staff members, for an HT practitioner to only pretend to be available to help and to avoid physical contact with the patient. In addition, our 2 practitioners would be fairly recognizable to operating room staff members, making it difficult to disguise their purpose in the operating room. The practitioners also perform HT on staff members, so having a sham practitioner available was not possible.

Because the study is not blinded, there is a certain possibility for bias or for rival hypotheses. We addressed this through randomization and through the 3-branch study design. Once patients were enrolled in the study, they were assigned randomly to their study group. We felt that as a result, those whose interest in HT may skew their results would be evenly distributed among the groups. We added the visitor group to the study to address the idea that any additional attention given to the patient would improve outcomes. By comparing this group to the HT group, we felt we could get closer to the true effect of HT.

Although the study demonstrated a significant change in anxiety (HT=6.3, visitor=5.8, control=1.8, P=.01), a more accurate measurement may have been achieved by administering the survey more frequently. The questionnaire was given at the beginning of the therapeutic relationship, when hesitancy in sharing feelings, especially stress and anxiety, is not uncommon; it was not administered again until postoperative day 4, when the treatment effect may have waned somewhat. A better measurement may have been to administer the survey immediately pre- and post-session to HT and visitor patients, in addition to the existing pre- and postoperative measurements.

Initial enrollment was slow due to the exclusion of inpatients from the study. Upon review, it was determined that in the interest of increasing sample size, the exclusion criteria should be changed to allow for inpatient participation. Inpatients were classified as urgent, having had a coronary angiogram—most within 24 hours before the CAB surgery—resulting in patients with higher stress levels and increased potential for compromised renal function. Due to the differences in inpatient and outpatient outcomes in general, results for both groups were to be examined separately.

Toward the end of the study, as HT became more recognized and accepted, patient recruitment became progressively more difficult. Many study-eligible patients requested HT and chose not to participate because of the risk that they may fall into the visitor or control group.

Study Implications

Using our hospital data for all CAB patients, the average daily cost in our hospital system was estimated to be about $2000 per patient at the time of the study. This would translate to roughly $500 000 in savings for our hospital system per year for CAB procedures alone, thus offsetting the relatively minor fixed expense of providing the service of an experienced, certified HT practitioner.

Since initiation of this study in our hospital system, staff perception of the usefulness and applicability of HT has changed dramatically. An increasing number of nurses who provide cardiac care at the bedside have undergone HT training and are working toward certification. In 2005, nearly 600 HT sessions were provided for cardiac surgical patients. As a result of this study as well as patient demand, a hospital-funded healing arts program was designed and implemented in our hospital. This program was expanded to offer HT as a choice for all cardiac patients, with approximately 90% currently taking advantage of the program. Moreover, requests from other areas of the hospital have grown, including but not limited to those from patients undergoing stressful procedures, having difficulty sleeping, or feeling depressed due to a prolonged hospital stay. With the growing interest in the application of HT across a broad range of patient care experiences, it is recommended that researchers interested in conducting additional studies include measurements of patient satisfaction and employee engagement with HT as part of their study design and outcomes.

Our study was conducted on first-time elective CAB patients. For logistic reasons, patients requiring immediate surgery were excluded from the study as were cardiac-surgical patients undergoing a second CAB surgery or a cardiac valve repair or replacement. As a group, cardiac surgical patients have stressors in common, and pre- and postoperative procedures are similar. There are parallels with patients undergoing other types of surgery as well, including stressors such as (1) fear of the unknown, (2) effects of anesthesia (eg, nausea and postoperative depression), and (3) postoperative complications such as infection affecting length of stay.

In our study on cardiac-surgical patients, we showed no difference in age or gender; therefore, these study results could be applied to the inpatient adult cardiac population (children were not studied). As other studies have looked at outpatient settings, this study was intended to improve outcomes and the patient experience in a cardiac surgical inpatient setting. Due to the common themes among surgical patients throughout a hospital setting, HT could be expected to benefit patients in acute settings beyond the cardiac-surgical area.

Although difficult to quantify, spiritual and emotional factors are becoming increasingly recognized as a potential aid or hindrance to outcomes from medical interventions. Hospitals are increasingly creating modern-day "healing environments" that borrow from principals of ancient wisdom and new understandings of the attention to individualized care that is needed alongside new technologies. These coupled with integrative programs are largely based on consumer demand but also an increasing awareness aided by medical research that a sense of peace, serenity, and safety via emotional connections can have powerful influences on outcomes. As such, HT lends itself as a natural complementary therapy to be brought to the bedside as well as an approach that warrants future study.

Healing touch is becoming more widely known at the bedside of hospitalized patients due to its roots in nursing via nursing theorists who have pioneered ideas regarding unified field theory.[34] As such, it is not the technique alone that is important to the HT

intervention but the rapport and partnership created with the patient going through a potentially life-transforming event. Practitioners of HT seek to facilitate the client's innate self-healing abilities, which may in part inspire consciousness—awareness, choice, acceptance, and balance.

In this study, something that is seldom seen in a hospitalized setting was achieved; that is, a nurse visitor or nurse/HT practitioner was a consistent and familiar guide through the process from preoperative education through the postoperative recovery phase. Moreover, this study design necessitated cooperation and support on the part of staff members from surgical admitting and the operating room to intensive care and telemetry units, along with departments ranging from chaplaincy to anesthesiology and cardiac rehabilitation. It would be difficult to discuss this study with its methodology and outcomes without addressing some of the cultural changes that were observed in the process of its implementation and in its aftermath. It is important to remember that there is a story and an individual with emotions and choices behind each painstakingly examined statistic that cannot be ignored. At the very heart of this study is the movement toward recognizing that the metaphoric and physical heart are both very real, if we allow them to be.

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