STUDIES OF REMOTE INTERCESSORY PRAYER:
A Bibliography of Articles from the Health Care Literature

John W. Ehman
Revised, 12/4/06

The efficacy of remote intercessory prayer has been much debated in health care in recent years and at times has seemed to dominate the general discussion of the significance of patient spirituality/religiosity to health/health care. The following list of articles provides some context for this subject and is organized in six parts: **I**, early intercessory prayer studies in the modern health care literature; **II**, the 1988 Byrd study that has spurred continuing debate; **III**, some studies between 1988 and 1998 on intercessory prayer and other possibly related modalities; **IV**, the 1999 Harris, et al., study that re-ignited the debate originally spurred by the Byrd study; **V**, studies published 2000-2005; and **VI**, some recent reviews of intercessory prayer studies.

I. Early intercessory prayer studies in the modern health care literature:

Collipp, P. J. "**The efficacy of prayer: a triple-blind study**." *Medical Times* 97, no. 5 (May 1969): 201-204.

This study of eighteen children with leukemia (ten in an intervention group and eight in a control group) was inspired by the 1965 Joyce and Welldon study [see below]. Members of the control group were prayed for over fifteen months by families from ten Protestant churches in another city. Neither the church members who prayed for the children, nor the physicians who treated the children, nor the children themselves or their families were told that they were engaged in an intercessory prayer study. Among the findings: at the end of the intervention period, seven of the ten children in the intervention group were still alive, but only two of the of the eight children in the control group. The author notes: "The number of patients in the two groups is at the lower limit for evaluation by the X^2 test. The difference in survival is at the 90% significance level if all patients are included..." (p. 202). "The small number of patients in this study precludes definite conclusions about the efficacy of prayer. Our data does support the concept, however, that prayers for the sick are efficacious" (p. 202). The article concludes with the citation of several scripture verses and a broad generalization about the use and efficacy of prayer, seemingly indicating a predisposition by the author.

Joyce, C. R. B. and Welldon. R. M. C. "**The objective efficacy of prayer. A double-blind clinical trial**." *Journal of Chronic Diseases* 18, no. 4 (April 1965): 367-377.

The authors of this study, self-described as being one a "skeptic" and one a "believer" (p. 375), take up the statistical inquiry of the effect of intercessory prayer on health that was originally suggested by the 19th century work of Francis Galton (*Inquiries into Human Faculty and Its Development*, London: Macmillan, 1883, pp. 277-94). Nineteen pairs of outpatients from two clinics at the London Hospital, all of whom suffered from "chronic stationary or progressively deteriorating psychological or rheumatic disease" (p. 368) constituted control and intervention groups, the latter receiving regular prayer from members of Quaker or interdenominational Christian groups. The prayer method used was based upon silent meditation, and those offering prayer were given only basic medical synopses and the first names (with fictitious last initials) of the patients. The intervention was conducted over a period of at least six months. "[N]o advantage to either group was demonstrated..." (p. 374). The authors approach this work with both epistemological and statistical sophistication, and they address, in addition to the particular implications of their study, broad issues of research in this area (p. 368) and of the necessity for collaboration in developing a common language for the discussion of "scientific and non-scientific healing" (p. 375).

II. The 1988 Byrd study that has spurred continuing debate:

Byrd, R. C. "**Positive therapeutic effects of intercessory prayer in a coronary care unit population**." *Southern Medical Journal* 81, no. 7 (July 1988): 826-829.

[Abstract:] The therapeutic effects of intercessory prayer (IP) to the Judeo-Christian God, one of the oldest forms of therapy, has had little attention in the medical literature. To evaluate the effects of IP in a coronary care unit (CCU) population, a prospective randomized double-blind protocol was followed. Over ten months, 393 patients admitted to the CCU were randomized, after signing informed consent, to an intercessory prayer group (192 patients) or to a control group (201 patients). While hospitalized, the first group received IP by participating Christians praying outside the hospital; the control group did not. At entry, chi-square and stepwise logistic analysis revealed no statistical difference between the groups. After entry, all patients had follow-up for the remainder of the admission. The IP group subsequently had a significantly lower severity score based on the hospital course after entry (P less than .01). Multivariant analysis separated the groups on the basis of the outcome variables (P less than .0001). The control patients required ventilatory assistance, antibiotics, and diuretics more frequently than patients in the IP group. These data suggest that intercessory prayer to the Judeo-Christian God has a beneficial therapeutic effect in patients admitted to a CCU. [Medical Service, San Francisco General Medical Center, CA]

III. Some studies between 1988 and 1998 on intercessory prayer and other possibly related modalities:

O'Laoire, S. "**An experimental study of the effects of distant, intercessory prayer on self-esteem, anxiety, and depression**." *Alternative Therapies in Health & Medicine* 3, no. 6 (November 1997): 38-53.

[Abstract:] DESIGN: Randomized, controlled, double-blind study. PATIENTS: 496 volunteers: those who prayed (agents, n = 90) and those who were prayed for (subjects, n = 406). INTERVENTION: Agents were randomly assigned to either a directed or nondirected prayer group; photos and names of subjects were used as a focus. Subjects were randomly assigned to three groups: those prayed for by nondirected agents, a control group, and those prayed for by directed agents. Prayer was offered for 15 minutes daily for 12 weeks. Each subject was prayed for by three agents. MAIN OUTCOME MEASURES: Five pretest and posttest objective measures and six posttest subjective measures were taken. RESULTS: Subjects improved significantly on all 11 measures. Agents improved significantly on 10

measures. A significant positive correlation was found between the amount of prayer the agents did and their scores on the five objective tests. Agents had significantly better scores than did subjects on all objective measures. Subjects' views of the locus of God's action showed significance in three objective measures. Improvement on four objective measures was significantly related to subjects' belief in the power of prayer for others. Improvement on all II measures was significantly related to subjects' conviction concerning whether they had been assigned to a control or an experimental group. Possible explanations include the placebo/faith effect, the time displaced effect, and extraneous prayer.

Sicher, F., Targ, E., Moore, D. II and Smith, H. S. "**A randomized double-blind study of the effect of distant healing in a population with advanced AIDS. Report of a small scale study**." *Western Journal of Medicine* 169, no. 6 (December 1998): 356-363.

[Abstract:] Various forms of distant healing (DH), including prayer and "psychic healing," are widely practiced, but insufficient formal research has been done to indicate whether such efforts actually affect health. We report on a double-blind randomized trial of DH in 40 patients with advanced AIDS. Subjects were pair-matched for age, CD4+ count, and number of AIDS-defining illnesses and randomly selected to either 10 weeks of DH treatment or a control group. DH treatment was performed by self-identified healers representing many different healing and spiritual traditions. Healers were located throughout the United States during the study, and subjects and healers never met. Subjects were assessed by psychometric testing and blood draw at enrollment and followed for 6 months. At 6 months, a blind medical chart review found that treatment subjects acquired significantly fewer new AIDS-defining illnesses (0.1 versus 0.6 per patient, P = 0.04), had lower illness severity (severity score 0.8 versus 2.65, P = 0.03), and required significantly fewer doctor visits (9.2 versus 13.0, P = 0.01), fewer hospitalizations (0.15 versus 0.6, P = 0.04), and fewer days of hospitalization (0.5 versus 3.4, P = 0.04). Treated subjects also showed significantly improved mood compared with controls (Profile of Mood States score -26 versus 14, P = 0.02). There were no significant differences in CD4+ counts. These data support the possibility of a DH effect in AIDS and suggest the value of further research.

Walker, S. R., Tonigan, J. S,. Miller, W. R., Corner, S. and Kahlich, L. "**Intercessory prayer in the treatment of alcohol abuse and dependence: a pilot investigation**." *Alternative Therapies in Health & Medicine* 3, no. 6 (November 1997): 79-86.

[Abstract:] OBJECTIVE: To conduct a pilot study of the effect of intercessory prayer on patients entering treatment for alcohol abuse or dependence. DESIGN: In addition to standard treatment, 40 patients admitted to a public substance abuse treatment facility for treatment of alcohol problems who consented to participate were randomized to receive or not receive intercessory prayer (double-blind) by outside volunteers. Assessments were conducted at baseline, 3 months, and 6 months. RESULTS: No differences were found between prayer intervention and nonintervention groups on alcohol consumption. Compared with a normative group of patients treated at the same facility participants in the prayer study experienced a delay in drinking reduction. Those who reported at baseline that a family member or friend was already praying for them were found to be drinking significantly more at 6 months than were those who reported being unaware of anyone praying for them. Greater frequency of prayer by the participants themselves was associated with less drinking, but only at months 2 and 3. CONCLUSION: Intercessory prayer did not demonstrate clinical benefit in the treatment of alcohol abuse and dependence under these study conditions. Prayer may be a complex phenomenon with many interacting variables.

Wirth, D. P. and Cram, J. R. "**The psychophysiology of nontraditional prayer**." *International Journal of Psychosomatics* 41, nos. 1-4 (1994): 68-75.

[Abstract:] This study was a replication and extension of previous research which indicated that Non-Contact Therapeutic Touch had a significant effect in normalizing the activity of the "end organ" for the central nervous system (CNS). The study utilized a randomized double-blind within subject crossover methodological design to examine the effect of nontraditional distant prayer upon autonomic and CNS parameters. The impact of complementary healing was assessed utilizing multi-site surface electromyographic (sEMG) recordings located at the frontalis, Cervical 4 paraspinals, Thoracic 6 paraspinals, and Lumbosacral 3 paraspinals. The autonomic indicators of physiological activity included hand temperature, heart rate, skin conductance levels (SCL), and blood volume pulse (BVP). Twenty-one subjects were randomly assigned to treatment and control conditions for two thirty minute evaluation sessions for a total of forty-two psychophysiological monitoring periods. All participants were blinded to the true nature of the experimental protocol as well as the fact that a healing study was being conducted in order to control for suggestion, expectation of healing, and the placebo effect. The analysis of autonomic indicators demonstrated a slight decrease in BVP and heart rate, coupled with a minor increase in SCL suggesting a mild "anticipatory effect" arousal trend. The data also showed that two of the four muscle regions monitored-T6 and L3 paraspinals-indicated a significant reduction in electromagnetic energy during and following the distant healing treatment intervention for a majority of the subjects. For example, the T6 SEMG showed significance at the $p < .0002$ level, while the L3 SEMG indicated significance at the $p < .001$ level.

IV. The 1999 Harris, et al., study that re-ignited the debate originally spurred by the Byrd study:

Harris, W. S., Gowda, M., Kolb, J. W., Strychacz, C. P., Vacek, J. L., Jones, P. G., Forker, A., O'Keefe, J. H. and McCallister, B. D. "**A randomized, controlled trial of the effects of remote, intercessory prayer on outcomes in patients admitted to the coronary care unit**." *Archives of Internal Medicine* 159, no. 19 (October 25, 1999): 2273-2278.

[Abstract:] CONTEXT: Intercessory prayer (praying for others) has been a common response to sickness for millennia, but it has received little scientific attention. The positive findings of a previous controlled trial of intercessory prayer have yet to be replicated. OBJECTIVE: To determine whether remote, intercessory prayer for hospitalized, cardiac patients will reduce overall adverse events and length of stay. DESIGN: Randomized, controlled, double-blind, prospective, parallel-group trial. SETTING: Private, university-associated hospital. PATIENTS: Nine hundred ninety consecutive patients who were newly admitted to the coronary care unit (CCU). INTERVENTION: At the time of admission, patients were randomized to receive remote, intercessory prayer (prayer group) or not (usual care group). The first names of patients in the prayer group were given to a team of outside intercessors who prayed for them daily for 4 weeks. Patients were unaware that they were being prayed for, and the intercessors did not know and never met the patients. MAIN OUTCOME MEASURES: The medical course from CCU admission to hospital discharge was summarized in a CCU course score derived from blinded, retrospective chart review. RESULTS: Compared with the usual care group (n = 524), the prayer group (n = 466) had lower mean +/- SEM weighted (6.35 +/- 0.26 vs 7.13 +/- 0.27; P=.04) and unweighted (2.7 +/- 0.1 vs 3.0 +/- 0.1; P=.04) CCU course scores. Lengths of CCU and hospital

stays were not different. CONCLUSIONS: Remote, intercessory prayer was associated with lower CCU course scores. This result suggests that prayer may be an effective adjunct to standard medical care. [Mid America Heart Institute, Saint Luke's Hospital, Kansas City, MO]

V. Studies published 2000-2006:

Astin JA. Stone J. Abrams DI. Moore DH. Couey P. Buscemi R. Targ E. "**The efficacy of distant healing for human immunodeficiency virus--results of a randomized trial**." *Alternative Therapies in Health & Medicine* 12, no. 6 (November-December 2006): 36-41.

[Abstract:] BACKGROUND: While data are conflicting, studies have appeared in the literature suggesting that mental intentions sent from a distance (eg, intercessory prayer, spiritual healing) can possibly influence clinical outcomes in patients suffering from an array of medical conditions. The purpose of this study was to examine the potential efficacy of distant healing in a population of patients with human immunodeficiency virus (HIV)/aquired immune deficiency syndrome (AIDS). METHODS: One hundred fifty-six patients with a history of AIDS category C and at least one AIDS-defining opportunistic infection were randomized to 1 of 3 study arms: (1) 10 weeks of prayer/distant healing from professional healers, (2) 10 weeks of prayer/distant healing from nurses with no prior training or experience in distant healing, or, (3) no distant healing. RESULTS: No significant treatment effects of distant healing were observed for either professional healers or nurses on any of the primary or secondary outcomes. Despite being blind to group assignment, subjects receiving distant healing (from healers or nurses) were significantly more likely to guess that they had been receiving healing than were subjects randomized to the no-treatment control group. CONCLUSIONS: Distant healing or prayer from a distance does not appear to improve selected clinical outcomes in HIV patients who are on a combination antiretroviral therapy. [Research Support, N.I.H., Extramural]

Aviles, J. M., Whelan, E., Hernke, D. A., Williams, B. A., Kenny, K. E., O'Fallon, W. M. and Kopecky, S. L. "**Intercessory prayer and cardiovascular disease progression in a coronary care unit population: a randomized controlled trial**." *Mayo Clinic Proceedings* 76, no. 12 (December 2001): 1192-1198.

[Abstract:] OBJECTIVE: To determine the effect of intercessory prayer, a widely practiced complementary therapy, on cardiovascular disease progression after hospital discharge. PATIENTS AND METHODS: In this randomized controlled trial conducted between 1997 and 1999, a total of 799 coronary care unit patients were randomized at hospital discharge to the intercessory prayer group or to the control group. Intercessory prayer, i.e., prayer by 1 or more persons on behalf of another, was administered at least once a week for 26 weeks by 5 intercessors per patient. The primary end point after 26 weeks was any of the following: death, cardiac arrest, rehospitalization for cardiovascular disease, coronary revascularization, or an emergency department visit for cardiovascular disease. Patients were divided into a high-risk group based on the presence of any of 5 risk factors (age >=70 years, diabetes mellitus, prior myocardial infarction, cerebrovascular disease, or peripheral vascular disease) or a low-risk group (absence of risk factors) for subsequent primary events. RESULTS: At 26 weeks, a primary end point had occurred in 25.6% of the intercessory prayer group and 29.3% of the control group (odds ratio [OR], 0.83 [95% confidence interval (CI), 0.60-1.14]; P=.25). Among high-risk patients, 31.0% in the prayer group vs. 33.3% in the control group (OR, 0.90 [95% CI, 0.60-1.34]; P=.60) experienced a primary end point. Among low-risk patients, a primary end point occurred in 17.0% in the prayer group vs. 24.1% in the control group (OR, 0.65 [95% CI, 0.20-1.36]; P=.12). CONCLUSIONS: As delivered in this study, intercessory prayer had no significant effect on medical outcomes after hospitalization in a coronary care unit.

Benson, H., Dusek, J. A., Sherwood, J. B., Lam, P., Bethea, C. F., Carpenter, W., Levitsky, S., Hill, P. C., Clem, D. W., Jr., Jain, M. K., Drumel, D., Kopecky, S. L., Mueller, P. S., Marek, D., Rollins, S. and Hibberd, P. L. "**Study of the Therapeutic Effects of Intercessory Prayer (STEP) in cardiac bypass patients: A multicenter randomized trial of uncertainty and certainty of receiving intercessory prayer**." *American Heart Journal* 151, no. 4 (April 2006): 934-942.

[Abstract:] Background: Intercessory prayer is widely believed to influence recovery from illness, but claims of benefits are not supported by well-controlled clinical trials. Prior studies have not addressed whether prayer itself or knowledge/certainty that prayer is being provided may influence outcome. We evaluated whether (1) receiving intercessory prayer or (2) being certain of receiving intercessory prayer was associated with uncomplicated recovery after coronary artery bypass graft (CABG) surgery. Methods: Patients at 6 US hospitals were randomly assigned to 1 of 3 groups: 604 received intercessory prayer after being informed that they may or may not receive prayer; 597 did not receive intercessory prayer also after being informed that they may or may not receive prayer; and 601 received intercessory prayer after being informed they would receive prayer. Intercessory prayer was provided for 14 days, starting the night before CABG. The primary outcome was presence of any complication within 30 days of CABG. Secondary outcomes were any major event and mortality. Results: In the 2 groups uncertain about receiving intercessory prayer, complications occurred in 52% (315/604) of patients who received intercessory prayer versus 51% (304/597) of those who did not (relative risk 1.02, 95% CI 0.92-1.15). Complications occurred in 59% (352/601) of patients certain of receiving intercessory prayer compared with the 52% (315/604) of those uncertain of receiving intercessory prayer (relative risk 1.14, 95% CI 1.02-1.28). Major events and 30-day mortality were similar across the 3 groups. Conclusions: Intercessory prayer itself had no effect on complication-free recovery from CABG, but certainty of receiving intercessory prayer was associated with a higher incidence of complications.

Cha, K. Y., Wirth, D. P. and Lobo, R. A. "**Does prayer influence the success of in vitro fertilization-embryo transfer? Report of a masked, randomized trial**." *Journal of Reproductive Medicine* 46, no. 9 (September 2001): 781-787.

[Abstract:] OBJECTIVE: To assess the potential effect of intercessory prayer (IP) on pregnancy rates in women being treated with in vitro fertilization-embryo transfer (IVF-ET). STUDY DESIGN: Prospective, double-blind, randomized clinical trial in which patients and providers were not informed about the intervention. Statisticians and investigators were masked until all the data had been collected and clinical outcomes were known. The setting was an IVF-ET program at Cha Hospital, Seoul, Korea. IP was carried out by prayer groups in the United States, Canada and Australia. The investigators were at a tertiary medical center in the United States. The patients were 219 women aged 26-46 years who were consecutively treated with IVF-ET over a four-month period. Randomization was performed after stratification of variables in two groups: distant IP vs. no IP. The clinical pregnancy rates in the two groups were the main outcome measure. RESULTS: After clinical pregnancies were known, the data were unmasked to assess the effects of IP after assessment of multiple comparisons in a log-linear model. The IP group had a higher pregnancy rate as compared to the no-IP rate (50% vs. 26%, P = .0013). The IP group showed a higher implantation rate (16.3% vs. 8%, P = .0005). Observed effects were independent of clinical or

laboratory providers and clinical variables. CONCLUSION: A statistically significant difference was observed for the effect of IP on the outcome of IVF-ET, though the data should be interpreted as preliminary.

Dusek, J. A., Sherwood, J. B., Friedman, R., Myers, P., Bethea, C. F., Levitsky, S., Hill, P. C., Jain, M. K., Kopecky, S. L., Mueller, P. S., Lam, P., Benson, H. and Hibberd, P. L. "**Study of the Therapeutic Effects of Intercessory Prayer (STEP): study design and research methods**." *American Heart Journal* 143, no. 4 (April 2002): 577-584.

[Abstract:] BACKGROUND: The effect of intercessory prayer (IP) on outcome in cardiac cases has been evaluated previously, but results are controversial. The goals of the Study of the Therapeutic Effects of Intercessory Prayer (STEP) are to evaluate the effects of receipt of additional study IP and awareness of receipt of additional study IP on outcomes in patients undergoing coronary artery bypass graft surgery. STEP is not designed to determine whether God exists or whether God does or does not respond to IP. METHODS: STEP is a multicenter, controlled trial of 1802 patients in 6 US hospitals, randomized to 1 of 3 groups. Two groups were informed that they may or may not receive 14 consecutive days of additional IP starting the night before coronary artery bypass graft surgery; Group 1 received IP, Group 2 did not. A third group (Group 3) was informed that they would receive additional IP and did so. Three mainstream religious sites provided daily IP for patients assigned to receive IP. At each hospital, research nurses blinded to patient group assignment reviewed medical records to determine whether complications occurred, on the basis of the Society for Thoracic Surgeons definitions. A blinded nurse auditor from the Coordinating Center reviewed every study patient's data against the medical record before release of study forms. RESULTS: The STEP Data and Safety Monitoring Board reviewed patient safety and outcomes in the first 900 study patients. Patients were enrolled in STEP from January 1998 to November 2000.

Krucoff, M. W., Crater, S. W., Gallup, D., Blankenship, J. C., Cuffe, M., Guarneri, M., Krieger, R. A., Kshettry, V. R., Morris, K., Oz, M., Pichard, A., Sketch, M. H., Jr., Koenig, H. G., Mark, D. and Lee, K. L. "**Music, imagery, touch, and prayer as adjuncts to interventional cardiac care: the Monitoring and Actualisation of Noetic Trainings (MANTRA) II randomised study**." *Lancet* 366, no. 9481 (July 16-22, 2005): 211-217

[Abstract:] BACKGROUND: Data from a pilot study suggested that noetic therapies—healing practices that are not mediated by tangible elements—can reduce preprocedural distress and might affect outcomes in patients undergoing percutaneous coronary intervention. We undertook a multicentre, prospective trial of two such practices: intercessory prayer and music, imagery, and touch (MIT) therapy. METHODS: 748 patients undergoing percutaneous coronary intervention or elective catheterisation in nine USA centres were assigned in a 2×2 factorial randomisation either off-site prayer by established congregations of various religions or no off-site prayer (double-blinded) and MIT therapy or none (unmasked). The primary endpoint was combined in-hospital major adverse cardiovascular events and 6-month readmission or death. Prespecified secondary endpoints were 6-month major adverse cardiovascular events, 6 month death or readmission, and 6-month mortality. FINDINGS: 371 patients were assigned prayer and 377 no prayer; 374 were assigned MIT therapy and 374 no MIT therapy. The factorial distribution was: standard care only, 192; prayer only, 182; MIT therapy only, 185; and both prayer and MIT therapy, 189. No significant difference was found for the primary composite endpoint in any treatment comparison. Mortality at 6 months was lower with MIT therapy than with no MIT therapy (hazard ratio 0·35 (95% CI 0·15–0·82, p=0·016). INTERPRETATION: Neither masked prayer nor MIT therapy significantly improved clinical outcome after elective catheterisation or percutaneous coronary intervention.

Lesniak, K. T. "**The effect of intercessory prayer on wound healing in nonhuman primates**." *Alternative Therapies in Health & Medicine* 12, no. 6 (November-December 2006): 42-48.

[Abstract:] OBJECTIVES: This study was performed to examine the effects of intercessory prayer (IP) on wound healing and related physiological and behavioral factors in nonhuman primates. DESIGN: Twenty-two bush babies (Otolemur garnettii) with chronic self-injurious behavior (SIB) were stratified by wound severity and matched by total wound area. The animals were then randomized to IP and L-tryptophan or L-tryptophan only for treatment of SIB and related wounds. The IP intervention was conducted in a double-blind, randomized manner. Prayer was conducted daily for 4 weeks. Initiation of prayer was coincident with the first day of L-tryptophan administration. Physiological and behavioral variables were assessed at baseline and end of study. RESULTS: Following IP/L-tryptophan treatment, prayer-group animals had a reduction in wound size compared to non-prayer animals (P=.028). Prayer-group animals had a greater increase in red blood cells (P=.006), hemoglobin (P=.01), and hematocrit (P=.018); a greater reduction in both mean corpuscular hemoglobin (P=.023) and corpuscular volume (P=.008); and a reduction in wound grooming (P=.01) and total grooming behaviors (P=.04) than non-prayer-group animals. CONCLUSIONS: The results of this study are consistent with prior human trials of IP effectiveness, but suggest IP-induced health improvements may be independent of confounds associated with human participants. Findings may provide direction for study of the mechanisms of IP-induced health improvements in both human and animal models. [Research Support, N.I.H., Extramural]

Leibovici, L. "**Effects of remote, retroactive intercessory prayer on outcomes in patients with bloodstream infection randomised controlled trial**." *BMJ* 323, no. 7327 (December 22-29, 2001): 1450-1451.

[Abstract:] OBJECTIVE: To determine whether remote, retroactive intercessory prayer, said for a group of patients with a bloodstream infection, has an effect on outcomes. DESIGN: Double blind, parallel group, randomized controlled trial of a *retroactive* [italics added] intervention. SETTING: University hospital. SUBJECTS: All 3393 adult patients whose bloodstream infection was detected at the hospital in 1990-6. INTERVENTION: In July 2000 patients were randomized to a control group and an intervention group. A remote, retroactive intercessory prayer was said for the well being and full recovery of the intervention group. MAIN OUTCOME MEASURES: Mortality in hospital, length of stay in hospital, and duration of fever. RESULTS: Mortality was 28.1% (475/1691) in the intervention group and 30.2% (514/1702) in the control group (P for difference=0.4). Length of stay in hospital and duration of fever were significantly shorter in the intervention group than in the control group (P=0.01 and P=0.04, respectively). CONCLUSION: Remote, retroactive intercessory prayer said for a group is associated with a shorter stay in hospital and shorter duration of fever in patients with a bloodstream infection and should be considered for use in clinical practice. [Dept. of Medicine, Beilinson Campus, Rabin Medical Center, Petah-Tiqva 49100, Israel]

Matthews, D. A., Marlowe, S. M. and MacNutt, F. S. "**Effects of intercessory prayer on patients with rheumatoid arthritis**." *Southern Medical Journal* 93, no. 12 (December 2000): 1177-1186.

[Abstract:] BACKGROUND: Many individuals pray during times of illness, but the clinical effects of prayer are not well-understood. METHODS: We prospectively studied a cohort of 40 patients (mean age, 62 years; 100% white; 82% women) at a private rheumatology

practice. All had class II or III rheumatoid arthritis and took stable doses of antirheumatic medications. All received a 3-day intervention, including 6 hours of education and 6 hours of direct-contact intercessory prayer. Nineteen randomly selected sample patients had 6 months of daily, supplemental intercessory prayer by individuals located elsewhere. Ten arthritis-specific outcome variables were measured at baseline and at 3-month intervals for 1 year. RESULTS: Patients receiving in-person intercessory prayer showed significant overall improvement during 1-year follow-up. No additional effects from supplemental, distant intercessory prayer were found. CONCLUSIONS: In-person intercessory prayer may be a useful adjunct to standard medical care for certain patients with rheumatoid arthritis. Supplemental, distant intercessory prayer offers no additional benefits.

Matthews, W. J., Conti, J. M. and Sireci, S. G. "**The effects of intercessory prayer, positive visualization, and expectancy on the well-being of kidney dialysis patients**." *Alternative Therapies in Health & Medicine* 7, no. 5 (September-October 2001): 42-52.

[Abstract:] CONTEXT: Little replicable empirical evidence on the effectiveness of prayer is available. OBJECTIVE: To explore the effect of intercessory prayer, positive visualization, and outcome expectancy on a wide range of medical and psychological measures in critically ill patients. DESIGN: 2 x 3 (expectancy x treatment) factorial study. PARTICIPANTS: 95 adult male and female volunteer hemodialysis subjects with end-stage renal disease from an outpatient clinic in Miami, Fla. INTERVENTION: Participants were randomly assigned to 1 of the 6 treatment conditions. MAIN OUTCOME MEASURES: A total of 20 dependent measures (10 medically based and 10 psychological) were used to assess the subjects' overall well-being. Analysis of covariance was used to control for pre-treatment differences between groups. RESULTS: Subjects who expected to receive intercessory prayer reported feeling significantly better than did those who expected to receive positive visualization ($F1.93 = 5.42$; $P < .02$). No other statistically significant main effects or interactions were found for either expectancy, intercessory prayer, or positive visualization on the remaining dependent measures. Analysis of effect sizes on all dependent measures failed to indicate even a small magnitude of effect for intercessory prayer as contrasted with expectancy on the medical or psychological variables. CONCLUSIONS: The effects of intercessory prayer and transpersonal positive visualization cannot be distinguished from the effect of expectancy. Therefore, those 2 interventions do not appear to be effective treatments.

Palmer, R. F., Katerndahl, D. and Morgan-Kidd, J. "**A randomized trial of the effects of remote intercessory prayer: interactions with personal beliefs on problem-specific outcomes and functional status**." *Journal of Alternative & Complementary Medicine* 10, no. 3 (Jun 2004): 438-448.

[Abstract:] OBJECTIVES: Investigate the relevance of interpersonal belief factors as modifiers of the effectiveness of intercessory prayer. DESIGN: Randomized clinical trial. SETTING/LOCATION: Community-dwelling adults recruited from seven local church groups. SUBJECTS: Eighty-six (86) male and female participants 18-88 years of age were randomly assigned to either treatment (n = 45) or control groups (n = 41). INTERVENTIONS: Several volunteers committed to daily prayer for participants in the intervention group. Intercessory prayer commenced for 1 month and were directed toward a life concern or problem disclosed by the participant at baseline. Participants were unaware of being prayed for. Outcomes measures: Degree to which their problem had been resolved and the current level of concern they had about a specific life problem they described at baseline. Four component scores from the Medical Outcomes Study SF-20 were also used. RESULTS: No direct intervention effect on the primary outcomes was found. A marginally significant reduction in the amount of pain was observed in the intervention group compared to controls. The amount of concern for baseline problems at follow-up was significantly lower in the intervention group when stratified by subject's baseline degree of belief that their problem could be resolved. Prayer intervention appeared to effectively reduce the subject's level of concern only if the subject initially believed that the problem could be resolved. Those in the intervention group who did not believe in a possible resolution to their problem did not differ from controls. Better physical functioning was observed in the intervention group among those with a higher belief in prayer and surprisingly, better mental health scores were observed in the control group with lower belief in prayer scores. CONCLUSIONS: The results of the current study underscore the role of interpersonal belief in prayer efficacy and are consistent with the literature showing the relevance of belief in health and well-being in general. The relevance of interpersonal belief factors of the participants is recommended in future investigations.

Seskevich JE. Crater SW. Lane JD. Krucof MW. "**Beneficial effects of noetic therapies on mood before percutaneous intervention for unstable coronary syndromes**." *Nursing Research* 53, no. 2 (March-April 2004): 116-121.

[Abstract:] BACKGROUND: Many common medical, surgical, and diagnostic procedures performed for conscious patients can be accompanied by significant anxiety. Mind-body-spirit interventions could serve as useful adjunctive treatments for the reduction of stress. OBJECTIVE: To evaluate the effects of stress management, imagery, touch therapy, remote intercessory prayer, and standard therapy on mood in patients awaiting percutaneous interventions for unstable coronary syndromes as part of the Monitoring and Actualization of Noetic Training (MANTRA) trial, which explored the feasibility and efficacy of noetic interventions on clinical outcomes in a randomized clinical trial. METHODS: A total of 150 patients were randomized to one of the five treatment conditions. Stress management, imagery, and touch therapy were administered in 30-minute treatment sessions immediately before the cardiac intervention. Intercessory prayer was not necessarily contemporaneous with these treatments. Mood was assessed by a set of visual analog scales before and after treatment for a similar length of time for the standard therapy and prayer groups. RESULTS: Analysis of complete data from 108 patients showed that stress management, imagery, and touch therapy all produced reductions in reported worry, as compared with standard therapy, whereas remote intercessory prayer had no effect on mood. The ratings of other similar moods were not affected, perhaps because of the relatively positive emotional state observed in the participants before treatment. CONCLUSIONS: The results suggest that at least some noetic therapies may have beneficial effects on mood in the course of medical and surgical interventions. Administration of these interventions was feasible even in the hectic environment of the coronary intensive care unit. Given their relatively low cost and limited potential for adverse effects, these interventions merit further study as therapeutic adjuncts.

Zachariae, R., Hojgaard, L., Zachariae, C., Vaeth, M., Bang, B. and Skov, L. "**The effect of spiritual healing on in vitro tumour cell proliferation and viability--an experimental study**." *British Journal of Cancer* 93, no. 5 (Sep 5, 2005): 538-543.

[Abstract:] Alternative treatments such as spiritual healing and prayer are increasingly popular, especially among patients with life-threatening diseases such as cancer. According to theories of spiritual healing, this intervention is thought to influence living cells and organisms independently of the recipient's conscious awareness of the healer's intention. The aim of this study was to test the hypothesis that spiritual healing will reduce proliferation and viability of two cancer cell lines in vitro. Three controlled experiments were conducted with three different healers and randomised allocation of cells to five different doses of healing or control. Researchers conducting the

assays and statistical analyses were blinded to the experimental conditions. Main outcome measures were MTT viability, 3H-thymidine incorporation and counts of an adherent human breast cancer cell line (MCF-7), and a nonadherent mouse B-lymphoid cell line (HB-94). Analyses of variance (ANOVAs) revealed no significant main or dose-related effects of spiritual healing compared to controls for either of the two cell lines or any of the assays (P-values between 0.09 and 0.96). When comparing healing and control across all three experimental days, doses, assays, and cells, 34 (51.6%) of 66 independent comparisons showed differences in the hypothesised direction (P = 0.90). The average effect size across cell lines, days, assays, and doses approached zero (Cohen's d = -0.01). The results do not support previous reports of beneficial effects of spiritual healing on malignant cell growth in vitro. Reported beneficial effects of spiritual healing on the well-being of cancer patients seem more likely to be mediated by psychosocial and psychophysiological effects of the healer-patient relationship.

VI. Some recent reviews of intercessory prayer studies:

Astin, J. A., Harkness, E. and Ernst, E. "**The efficacy of 'Distant Healing': a systematic review of randomized trials**." *Annals of Internal Medicine* 132, no. 11 (June 6, 2000): 903-910.

The article reviews 23 studies of "distant healing" (considered here to be prayer, spiritual healing, mental healing, or therapeutic touch). [From the abstract:] Of the 23 studies, 13 (57%) yielded statistically significant treatment effects, 9 showed no effect over control interventions, and 1 showed a negative effect. CONCLUSIONS: The methodologic limitations of several studies make it difficult to draw definitive conclusions about the efficacy of distant healing. However, given that approximately 57% of trials showed a positive treatment effect, the evidence thus far merits further study.

Chibnall, J. T., Jeral, J. M. and Cerullo, M. A. "**Experiments on distant intercessory prayer: God, science, and the lesson of Massah**." *Archives of Internal Medicine* 161, no. 21 (November 26, 2001): 2529-2536.

[Abstract:] Experimental studies on the health effects of distant intercession (prayer) ignore important facets of construct validity, philosophy of science, and theology while focusing on issues like randomization and double-blinding. These tendencies reflect a desire on the part of researchers to remove nature as a causal factor when intercession seems efficacious. We argue that close attention to construct validity of cause-and-effect variables invalidates distant intercessory prayer as a scientific construct. Further, the application of statistical techniques to metaphysical causal phenomena is critiqued. We conclude that research on the effects of religion and spirituality on health should avoid attempting to validate God through scientific methods.

Dossey, L. "**Prayer and medical science: a commentary on the prayer study by Harris et al. and a response to critics**." *Archives of Internal Medicine* 160, no. 12 (June 26, 2000): 1735-1737.

This commentary largely defends the study by W. S. Harris, et al., "A randomized, controlled trial of the effects of remote, intercessory prayer on outcomes in patients admitted to the coronary care unit," *Archives of Internal Medicine* 159, no. 19 (Oct. 25, 1999): 2273-8. It stands in a practical relationship to fifteen letters by, among others, Richard Sloan, presented in the same issue of the journal (see pp. 1870-7) along with a reply by W. S. Harris (see pp. 1877-8).

Halperin, E. C. "**Should academic medical centers conduct clinical trials of the efficacy of intercessory prayer?**" *Academic Medicine* 76, no. 8 (August 2001): 791-797.

[Abstract:] Intercessory prayers for health or healing are requests to an object of worship for the preservation or restoration of health. There has been a recent proliferation of clinical trials that compare the health outcome of a group of prayed-for patients with that of controls, to test the efficacy of intercessory prayer. In this essay, the author defines the concept of intercessory prayer, contrasts it with other forms of prayer, and reviews the literature concerning clinical trials of its efficacy. The arguments put forward in favor of conducting such trials and those against are described and the reader is invited to consider their relative merits. The author concludes by discussing the potential power of faith in healing, reviewing the philosophical basis and pitfalls of clinical trials of intercessory prayer, and urging readers to weigh the arguments for and against such trials in academic medicine.

Hobbins, P. G. "**Compromised ethical principles in randomised clinical trials of distant, intercessory prayer**." *Journal of Bioethical Inquiry* 2, no. 3 (2005): 142-152.

[Abstract:] The effects of distant, intercessory prayer on health outcomes have been studied in a range of randomised, blinded clinical trials. However, while seeking the evidentiary status accorded this 'gold standard' methodology, many prayer studies fall short of the requirements of the World Medical Association's Declaration of Helsinki for the ethical conduct of trials involving human subjects. Within a sample of 15 such studies published in the medical literature, many were found to have ignored or waived key ethical precepts, including adequate standards of care, patient confidentiality and informed consent. Prayer was considered in most studies to pose negligible or no risk to subjects, despite the fact that no clear mechanism of action nor any safety monitoring procedures were described. As a result, many studies did not meet basic ethical standards required of clinical trials of biophysical interventions, making application of their results ethically problematic. If investigators wish their data to adequately inform the use or rejection of intercessory prayer to improve health, these shortcomings should be addressed in future studies.

Masters, K. S., Spielmans, G. I. and Goodson, J. T. "**Are there demonstrable effects of distant intercessory prayer? A meta-analytic review**." *Annals of Behavioral Medicine* 32, no. 1 (August 2006): 21-26.

[Abstract:] BACKGROUND: The use of alternative treatments for illness is common in the United States. Practitioners of these interventions find them compatible with personal philosophies. Consequently, distant intercessory prayer (IP) for healing is one of the most commonly practiced alternative interventions and has recently become the topic of scientific scrutiny. PURPOSE: This study was designed to provide a current meta-analytic review of the effects of IP and to assess the impact of potential moderator variables. METHODS: A random effects model was adopted. Outcomes across dependent measures within each study were pooled to arrive at one omnibus effect size. These were combined to generate the overall effect size. A test of homogeneity and examination of several potential moderator variables was conducted. RESULTS: Fourteen studies were included in the meta-analysis yielding an overall effect size of g = .100 that did not differ from zero. When one controversial study was removed, the effect size reduced to g = .012. No moderator variables significantly influenced results. CONCLUSIONS: There is no scientifically discernable effect for IP as assessed in controlled studies. Given that the IP

literature lacks a theoretical or theological base and has failed to produce significant findings in controlled trials, we recommend that further resources not be allocated to this line of research.

Powell, L. H., Shahabi, L. and Thoresen, C. E. "**Religion and spirituality. Linkages to physical health**." *American Psychologist* 58, no. 1 (January 2003): 36-52.

The authors apply a levels-of-evidence approach to assess the current body of research on linkages between religion/spirituality and health. The hypothesis that being prayed for improves physical recovery from acute illness—one of 9 hypotheses assessed—was found to be supported by "some evidence" (as opposed to "persuasive evidence," "inadequate evidence," or "consistent failures to show evidence." [This is one of four state-of-the-science articles comprising a special section on spirituality and health in this journal issue.]

Roberts, L., Ahmed, I. and Hall, S. "**Intercessory prayer for the alleviation of ill health**." *Cochrane Database of Systematic Reviews* [computer file]. (2):CD000368, 2000.

[Abstract:] BACKGROUND: Prayer is an ancient and widely used intervention for alleviating illness and promoting good health. This review focuses specifically on intercessory prayer, which is organized, regular and committed, and those who practice it will almost inevitably hold some committed belief that they are praying to God. Whilst the outcomes of trials of prayer cannot be interpreted as 'proof/disproof' of God's response to those praying, there may be an effect of prayer not dependent on divine intervention. This may be quantifiable, making this investigation of a most widely used health care intervention both possible and important. OBJECTIVES: To review the effectiveness of prayer as an additional intervention for those with health problems already receiving standard medical care. SEARCH STRATEGY: ATLA (1949-1997), Biological Abstracts (1985-1999), CINAHL (1982-1999), The Cochrane Schizophrenia Group's Register (December 1999), CCTR of the Cochrane Library (Issue 4, 1999), EMBASE (1980-1999), MEDLINE (1966-1999) and PsycLIT (1887-1999), Sociofile (1974-1996) and Sociological Abstracts (1963-1999) were methodically searched. All references of articles selected were searched for further relevant trials. SELECTION CRITERIA: Randomized trials of personal, focused, committed and organized intercessory prayer on behalf of anyone with a health problem were considered. Outcomes such as achievement of desired goals, death, illness, quality of life and well-being for the recipients of prayer, those praying and the care-givers were sought. DATA COLLECTION AND ANALYSIS: Studies were reliably selected and assessed for methodological quality. Data were extracted by two reviewers working independently. Dichotomous data were analyzed on an intention-to-treat basis. MAIN RESULTS: There was no evidence that prayer affected the numbers of people dying from leukemia or heart disease (OR 1.11, CI 0.79-1.56, n=1424). Intercessory prayer did not clearly decrease the odds of people with heart problems experiencing a bad or intermediate outcome (OR 0.8, CI 0.64-1.00, n=1444) but this finding was moved towards the null by inclusion of a negative assumption for those who were dropped from the analysis in one study. Prayer increased the odds of readmission to the Coronary Care Unit (OR 1.54 CI 1.02-2.33, n=1406) but these results are made significantly negative by the inclusion of an assumption of poor outcome for those not accounted for in the final analyses. REVIEWER'S CONCLUSIONS: Data in this review are too inconclusive to guide those wishing to uphold or refute the effect of intercessory prayer on health care outcomes. In the light of the best available data, there are no grounds to change current practices. There are few completed trials of the value of intercessory prayer, and the evidence presented so far is interesting enough to justify further study. If prayer is seen as a human endeavor it may or may not be beneficial, and further trials could uncover this. It could be the case that any effects are due to elements beyond present scientific understanding that will, in time, be understood. If any benefit derives from God's response to prayer it may be beyond any such trials to prove or disprove.

Targ, E. "**Research methodology for studies of prayer and distant healing**." *Complementary Therapies in Nursing & Midwifery* 8, no. 1 (February 2002): 29-41.

[Abstract:] The double-blind randomized clinical trial is the gold standard for trials of prayer and distant healing. Adequate blinding and randomization procedures should be followed and documented. The intervention must be well defined (include frequency, amount of time and training and/or experience level of healers). Subjects should have risks and benefits of study participation explained to them and sign informed consent before enrollment. Populations should be homogeneous. Consider stratification for smaller samples. Baseline information, including psychological status, beliefs about prayer and healing and other sources of prayer and healing, should be collected from subjects in clinical trials. This should be examined as part of the final data analysis for contribution to outcomes. Objectively measurable outcomes with adequate variability should be chosen. Subject study participation activities such as clinical interviews, traveling to special sites. journaling or meditation should be minimized to avoid washing out a small effect. In clinical trials subjects should be asked if they believed they were in the treatment group and this information should be entered as a co-variate for data analysis. Healers/prayers should be treated in a collegial and respectful way. Their healing efforts (time. location, method) should be documented in a log and they should be periodically contacted and encouraged by experimenters if the study' is taking place over an extended period of time. Observational and outcomes research can add an important dimension to healing research. Qualitative studies may also make an important contribution and help guide development of future controlled trials.

Turner, D. D. "**Just another drug? A philosophical assessment of randomised controlled studies on intercessory prayer**." *Journal of Medical Ethics* 32, no. 8 (August 2006): 487-490.

[Abstract:] The empirical results from recent randomised controlled studies on remote, intercessory prayer remain mixed. Several studies have, however, appeared in prestigious medical journals, and it is believed by many researchers, including apparent sceptics, that it makes sense to study intercessory prayer as if it were just another experimental drug treatment. This assumption is challenged by (1) discussing problems posed by the need to obtain the informed consent of patients participating in the studies; (2) pointing out that if the intercessors are indeed conscientious religious believers, they should subvert the studies by praying for patients randomised to the control groups; and (3) showing that the studies in question are characterised by an internal philosophical tension because the intercessors and the scientists must take incompatible views of what is going on: the intercessors must take a causation-first view, whereas the scientists must take a correlation-first view. It therefore makes no ethical or methodological sense to study remote, intercessory prayer as if it were just another drug.