

# MEASURING MYTHOLOGY: Startling Concepts in NCCAM Grants

Driven by misinformation, in 1992 Congress mandated funding of complementary and alternative medicine by establishing an Office at the National Institutes of Health with an initial budget of two million dollars. This office metamorphosed into a center with yearly funding comparable to the National Institutes of Health's well-established research centers. This study examines the last nearly twenty years of grant awards by the National Center for Complementary and Alternative Medicine.

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Americans reportedly spend thirty-four billion dollars annually on alternative medicine protocols and products. In 1992 when Congress mandated the funding of an Office to study alternative medicine at the National Institutes of Health (NIH) with a budget of two million dollars, it couldn't have predicted that in 2011 NIH would be funding marketing of "distance healing" and that Americans would be paying for delivery of alternative medicine in their health care bill (Patient Protection and Affordable Care Act 2010).

In 1999, the Office of Alternative Medicine evolved into an NIH center, the National Center for Complementary and Alternative Medicine (NCCAM), whose annual budget now averages \$134 million (Atwood 2003) (Figure 1).

Placing the office at the NIH implied a strategy of scientifically studying the medical legitimacy of a growing unregulated industry. But after twenty years, two billion dollars, thousands of funding awards, and hundreds of clini-

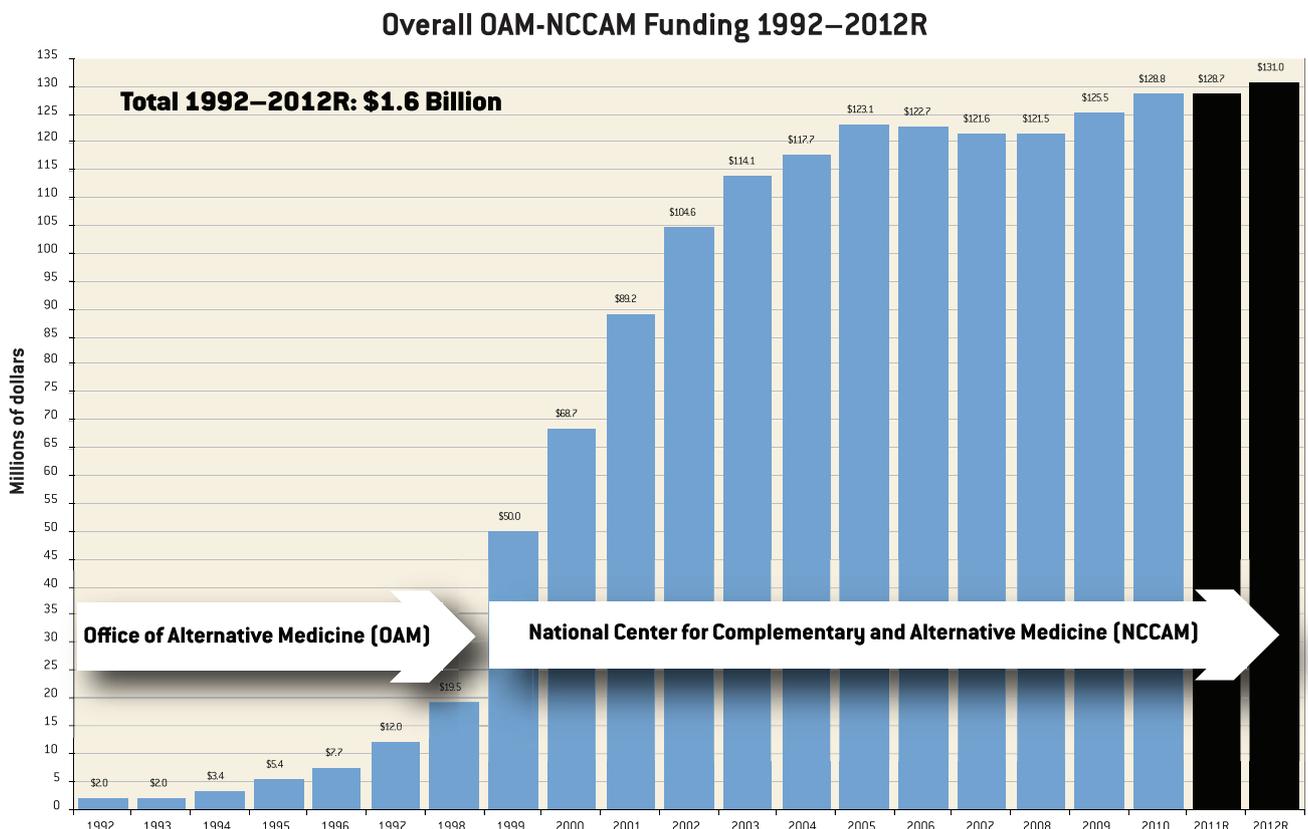


Figure 1: Overall Office of Alternative Medicine (OAM)-NCCAM funding from inception as a congressionally mandated office, OAM in 1992 with initial funding of two million dollars, to its present status as NCCAM and funding of \$129 million, a sixty-fold increase.

## Total Complementary and Alternative Medicine Funding by NIH Center/Institute 1999–2009

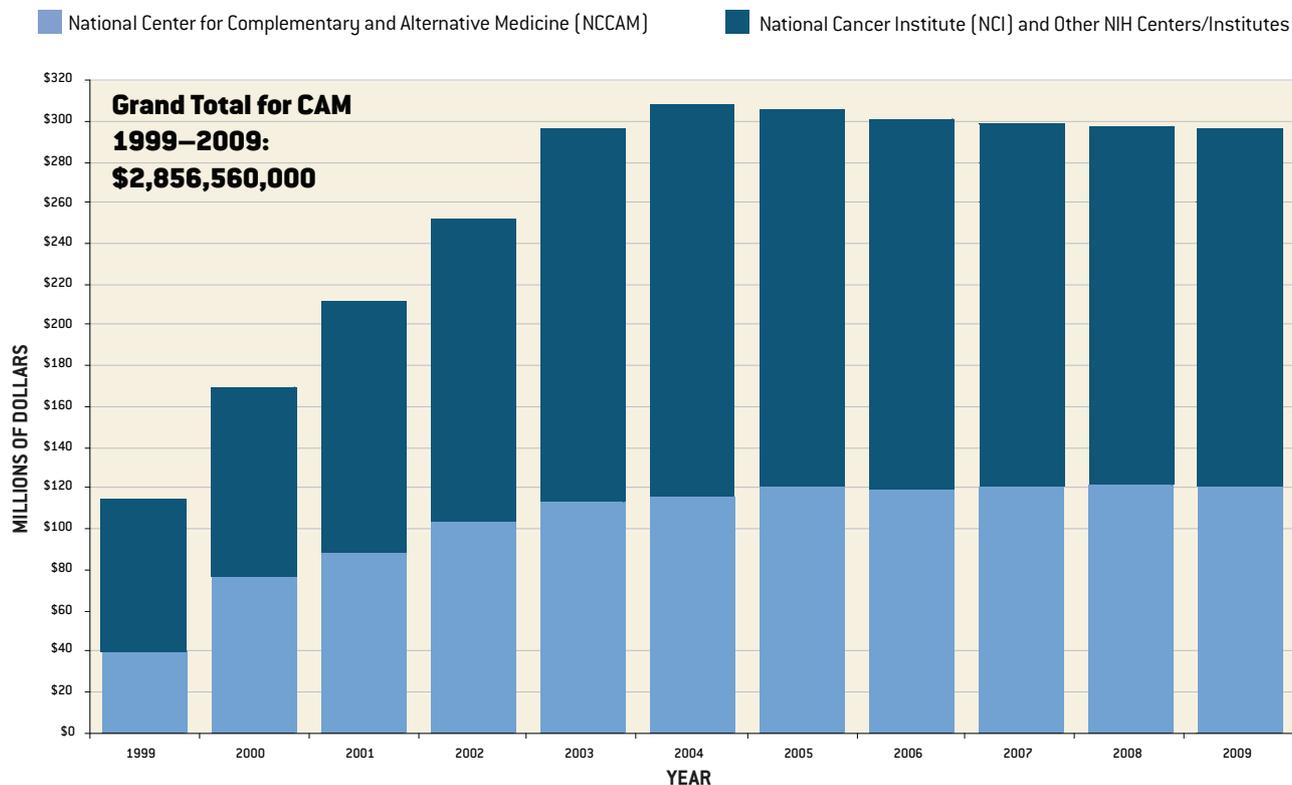


Figure 2: Grants awarded through NCCAM represent less than half of taxpayer dollars spent each year by NIH on Complementary and Alternative Medicine. The graph shows total CAM funding of \$2.9 billion spent over the ten-year period through 2009 [the latest year available to the authors via the NCCAM website that breaks out funding by year and by NIH Center/Institute at <http://nccam.nih.gov/about/budget/institute-center.htm>].

cal trials, it's sadly obvious the mandate is flawed. Few realize that funding awards for complementary and alternative medicine (CAM) are not limited to grants from NCCAM. Figure 2 shows the percentage of awards for CAM that has come from other NIH centers and offices.

Using data from the NIH website, we studied all NCCAM funding awards from 2000 to the present.<sup>1,2</sup> We found no discoveries in alternative medicine that justify the existence of the center; Congress has mandated into the health care bill the tax burden of paying for myths and commercial interests.

Billions of taxpayer dollars have been spent on testing botanicals, yoga, magnets, and distance healing as interventions for serious medical problems such as diabetes, HIV/AIDS, and cancer. Grants to naturopathic institutions since 2000 have totaled over thirty-two million dollars. Before reading this survey of NCCAM awards, the reader is invited to test his or her medical per-

ceptions against those of successfully funded awardees with the quiz on pp. 38–39.

What is most troublesome about this use of taxpayer dollars is the absence of posted results of completed NCCAM clinical trials on the NIH website. Queries to the director of NIH, Francis Collins, on this missing data went unanswered. A taxpayer who searches the NIH project reporter and clinical trials for needed medical information relating to alternative medicine will find startling concepts but few answers about their success. A person who might be facing the scary prospect of legitimate medical chemotherapy, deluged by warm-hearted marketing from alternative medicine via the web and print journalism, is left clueless.

Unsurprisingly, we found some negative results for CAM studies. Did Americans really need to spend millions of dollars to learn that “distance healing” cannot cure brain cancer or HIV/AIDS; shark cartilage does not affect the sur-

vival rates of cancer patients; vitamin E and selenium do not mitigate prostate cancer; magnets are not useful for fibromyalgia or carpal tunnel syndrome; and clinical trials using coffee enemas combined with heavy vitamin supplementation for patients with pancreatic or prostate cancer are unsafe? Terminated by an independent oversight monitoring committee was the seven- to twelve-year joint National Cancer Institute and NCCAM study comparing the effects of vitamin E and selenium on prostate cancer. The committee had found a slight (4 percent) increase in prostate cancer for all 32,000 participants. However, this trial is still listed as ongoing.

Worse, some funding awards—such as two million dollars to test magnet therapy and twenty-two million dollars to test distance healing—reveal an ignorance of basic science. From 1995 through 1998, the University of Virginia was funded to study the effect of magnetic mattress pads for sufferers of

fibromyalgia. Results of the study concluded “improvements (in pain intensity) did not differ significantly from changes in the Sham group or in the Usual Care group” (Alfano et al. 2001). This conclusion should discourage consumers from purchasing magnets for medical purposes and NCCAM from continuing awarding funds for this intervention. In 1999, Operation Cure All, a law enforcement and consumer education campaign launched by the Federal Trade Commission (FTC), targeted the claims of purveyors of magnet therapy devices and forced them to cease advertising. But despite the FTC’s legal actions in 1999 and a successful lawsuit brought by the National Council Against Health Fraud, NCCAM con-

tinued to fund magnet therapy. The University of Virginia was awarded \$446,000 from 2000–2005 to test the usefulness of pulsed magnetic mattress pads for alleviating arthritis. From 2006 through 2008 over half a million dollars was awarded to the Naturopathic College of Natural Medicine in Oregon to test the application of magnets for Carpal Tunnel Syndrome. These latter awardees concluded that despite learning there was no difference in pain intensity for participants assigned to the sham or active magnet groups, they needed further studies to optimize the dosage. In 2007 the University of North Carolina was awarded \$283,000 for the clinical trial “Craniosacral Therapy in Migraine,” which involved mag-

nets. Expected enrollment was sixty-six. Beth Israel Deaconess Medical Center, a “teaching hospital of Harvard Medical School,” received \$862,000 from 2000–2006 for “Research and Mentorship in Alternative Medicine,” which included magnet therapy. There are no studies conducted by Beth Israel on magnet therapy in the published literature, and Beth Israel’s website carries an ambivalent article refusing to acknowledge the impossibility of magnetic healing (Beth Israel Deaconess Medical Center 2010).

The magnets used in mattress pads in carpal tunnel and migraine studies, available commercially from sources such as Nikken, have a field strength of several hundred gauss—about the same

## CONDITIONS vs. INTERVENTIONS: Can You Match Them?

For nearly twenty years, NIH’s Center for Complementary and Alternative Medicine, NCCAM, has awarded funds totaling nearly two billion dollars to test interventions based on popular concepts such as botanicals, distance healing, magnets, and acupuncture for medical conditions such as migraine, cancer, diabetes, HIV/AIDS, and multiple sclerosis. Test your ability to match a few of these medical conditions with the intervention NCCAM has supplied funds to test; choose a medical condition and match it with one or more intervention. Answers on p. 43.

### MEDICAL CONDITION

1. Atherosclerosis—accumulation of cholesterol on artery wall
2. Brain Cancer—glioblastoma
3. Carpal Tunnel Syndrome
4. Cervical Cancer
5. Breast Cancer
6. Diabetes
7. Fibromyalgia
8. Hepatitis C
9. HIV/AIDS
10. Migraine
11. Multiple Sclerosis
12. Prostate Cancer
13. Rheumatoid Arthritis
14. Wound Healing
15. Head and Neck Cancer
16. Cardiovascular disease
17. Temporomandibula Joint disorder—frozen jaw

### INTERVENTION

- A. Herbs
- B. Expressive writing
- C. Prayer, a form of distance healing
- D. Mushroom extract
- E. Shark cartilage
- F. Pulsed magnetic fields
- G. Selenium plus vitamin E
- H. Static magnetic fields
- I. Therapeutic touch, a form of distance healing
- J. Soy compounds
- K. Reiki, a form of distance healing
- L. Mistletoe
- M. Acupuncture
- N. Flaxseed
- O. Shamanism
- P. Milk thistle
- Q. Vedic medicine

strength as refrigerator magnets. Nikken's website makes no claims for medical use of their magnets. As scientific studies and calculations have shown, and the FTC recognized in 1999, blood is not magnetic; therefore, magnets of this strength cannot influence the flow of ions across cell membranes. Thus whether they are located in mattress pads, at the wrists, or surrounding the head, no biochemistry can be initiated or inhibited by these magnets. From 1999 to the present, NIH's NCCAM has awarded millions of dollars for studies for a protocol that has no basis in science. Its website makes no mention of scientific studies and publications by physicists about this fact.<sup>1</sup>

The 1990s misconception about the energy of magnetic fields has a more recent counterpart: the commercial marketing of bracelets that purport to contain holograms that engage a "field" to improve athletic ability. This marketing is so successful that the company, Power Balance, could afford to purchase naming rights to the National Basketball Association Stadium in Sacramento, California. (For more on Power Balance bracelets, see "Power Balance Bracelets a Bust in Tests" on page 14.)

Not only have magnetic fields entered the NCCAM funding curriculum, but millions of dollars have been awarded for studies about the mythic "biofields" generated by Reiki, Therapeutic Touch, and Qigong. These protocols prescribe moving hands above a patient's body in a specialized set of motions that are supposed to initiate a cure of the medical condition. Use of these motions in a hospital trauma center can be seen on the Internet (Donnell 2010). The positioning differs slightly among these protocols but essentially involves an evocation of an undefined, unmeasured "energy field" that is purportedly emitted from the hand of the practitioner and interferes with an equally undefined field of the patient. Interestingly, accidental reverse motions that might leave the patient sicker are never mentioned. One recipient of an NCCAM grant to study the

efficacy of Therapeutic Touch, Gloria Gronowicz, was asked in July 2008 by a *Hartford Courant* reporter (Waldman 2008), "Should somebody with osteoporosis or a broken leg go 'to their Reiki practitioner?'" Gronowicz replied, "We don't know." The majority of the clinical trials associated with these "biofield" awards, which include prostate cancer, fibromyalgia, cervical cancer, and coronary artery disease, have been completed but few posted their results on NIH's official website (Figure 3).

Some grants to study the efficacy of this "hands off" healing did not require clinical trials; they involved animals. A licensed Reiki practitioner at the Cleveland Clinic received over a quarter of a million dollars (from 2002–2003) to study the "Effects of Energy Healers" on "... cholesterol-fed rabbits." The project description reads "... Specific Aims of the present application are: 1) to evaluate the possibility that energy healing treatments may decrease the progression of atherosclerosis in a rabbit model of cholesterol-induced atherosclerosis. ..." No results of the studies on these fatty rabbits can be found in the published literature.

Seventy-two grants have been awarded for interventions using Reiki, Therapeutic Touch, and Qigong. Courses licensing these practitioners are offered by integrative medicine clinics, and in some institutions they are an elective part of medical school education. Respected medical clinics and academic institutions offer courses in CAM protocols.<sup>3</sup> The website of the Qigong Institute in California features a list of NIH awards for Qigong and Energy Healing Research (Qigong Institute, n.d.). Readers can check with their local hospital or medical school to receive these treatments, which can be covered by the current health care bill.

Some scientists are alarmed at the growth of national misconceptions associated with these distance healing protocols. The Division of Biological Physics of the American Physical Society has endorsed a statement of its concerns on the use of distance healing: "[The division] deplores the misuse of

the term *energy* to mislead and defraud the public by improperly validating scientifically unsubstantiated healing protocols." NCCAM has awarded grants totaling \$11 million for these protocols.

Awards for medical intervention by distance healing came with other options. From 2000–2002, \$417,000 was granted to the California Pacific Medical Institute for "distant healing" of AIDS by nurses and "healers" who prayed for patients. The awardees published one of the few definitive results associated with NCCAM grants. It concluded: "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" (Astin et al. 2006).

Additional awards for healing by prayer: \$823,000 to study effect of prayer on glioblastoma and \$337,000 in 2003 for a clinical trial to study the efficacy of distance healing on wounds resulting from breast reconstruction surgery. No results are available for either of these awards.

One of the awardees, Elizabeth Targ, was a psychiatry professor at the California Pacific Medical Center in San Francisco. She died in 2002 at age forty-one of glioblastoma, a brain tumor, while conducting this NCCAM study into the efficacy of prayer on patients with the same cancer. In addition to being a founder-director of the Complementary Medicine Research Institute at the California Pacific Center, Targ was a research fellow at the Institute of Noetic Sciences, a group that promotes paranormal concepts.

Besides examining funding of "interventions," we scrutinized awards for treatments intended to mitigate HIV/AIDS, diabetes, prostate cancer, and heart disease.

In addition to funding prayer and Reiki healing protocols for HIV/AIDS, as part of an NIH multicenter effort NCCAM has contributed over three million dollars since 2000 for a study in South Africa documenting the safety of a widely used indigenous mushroom extract as a marker of this disease's pro-

gression (see Figure 4). The study reports that the extract is tolerated and its recruitment of sixty participants is continuing. There are no interim reports on its effectiveness.

Between 2000 and 2011 NCCAM has provided \$105 million for Complementary and Alternative Medicine (CAM) research for diabetes. These dollars were allocated across 362 projects. One of the trials, listed as completed in 2009, studied whether expressive writing would reduce stress and diabetic symptoms. As far as we can determine from public records, the total funding was \$106 million, about half of which came from NCCAM. Another trial, costing \$390,000, tested whether Maharishi Vedic Medicine could be an effective supplement in controlling type 2 diabetes. No results are available from either of these trials. Other diabetes trials featured vitamin C, Reiki, and Glucosamine. Glucosamine received a “thumbs down”; the results for the vitamin C and the Reiki trial are unknown. One trial, centered at Griffin Hospital at Yale University, reported, “Chromium supplementation was unlikely to attenuate diabetes risk” (Ali et al. 2011).

Healthy promises for soy consumption are a constant on the consumer

horizon. NCCAM funded 111 soy awards (from 2000–2010) totaling \$54 million. One result from Purdue University reported that soy did not significantly affect calcium metabolism and did not promote bone loss or calcium absorption in postmenopausal women (Spence 2005). A set of clinical trials (between 2000 and 2005) on the use of soy for treating several types of cancer was also completed, but their results have not been reported.

Acupuncture is a popular alternative protocol. NCCAM funding grants for acupuncture over eleven years, 2000–2011, have totaled \$78 million (240 grants for fifty-eight clinical trials), with one posted result that published no conclusion on the efficacy of this intervention for depression. In a recent publication in the peer-reviewed medical journal *Pain*, Ernst et al. (2011) studied the literature since 2000, across all languages, and concluded that “numerous systematic reviews have generated little truly convincing evidence that acupuncture is effective in reducing pain.” The paper also reported on adverse effects of the protocol.

Funding for botanicals totals about seventy-two million dollars. Many results are far from earth-shattering;

Ginkgo Biloba does not work for preventing Alzheimer’s or dementia; lemon and lavender oils don’t affect immunological responses.

“Mind-body medicine,” a heart-warming catch phrase implying personal control over medical problems, appears throughout NCCAM project descriptions. We found it in six hundred funding awards (totaling \$157 million). The mind-body mantra coupled with yoga embraced a subset of fifty grants totaling \$11 million.

Among the more startling concepts in the investigation of “mind-body medicine” were grants (of \$351,000) for “Transfer of Neural Energy Between Humans” to Bastyr, a college of naturopathic medicine, to test whether “a conscious state could exert biological effects at a distance” (Standish et al. 2004). “Thirty seven (37) females and 23 males (n=60; 30 pairs) participated in the study. The subjects were in separate rooms 14.5 meters apart. ... Subjects knew each other well and claimed to have previous experience of being emotionally/psychologically connected to one another.” Reported results of the clinical trial were based on data from four of the thirty pairs of subjects (four women paired with one man). However, when the experiments were repeated, “only one pair replicated the effect.” The authors concluded, “These results indicate that in some pairs of human subjects a signal may be detected in the brain of a distant member of the pair when the brain of the other member is visually stimulated.”

A second publication based on MRI imaging response of this matched pair came to a similar conclusion (Richards et al. 2005). Nowhere in the original grant is there any acknowledgment that the

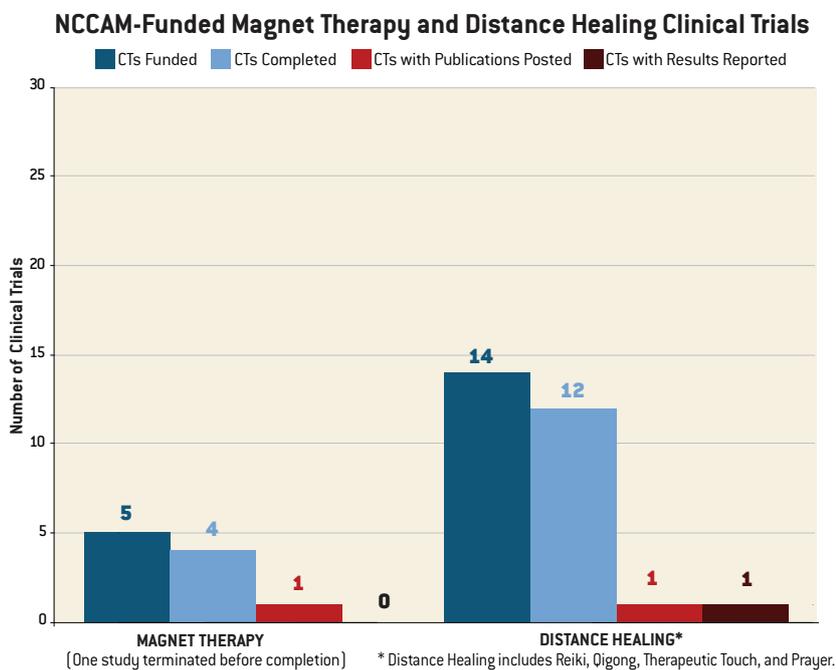


Figure 3: Clinical trials for two interventions. Nineteen funded clinical trials for magnets and distance healing, protocols that have no basis in physical laws. Of the originally funded nineteen trials, sixteen were completed (from 2000 to 2009). These involved 1,943 persons. Only two publications published the study and only one result was posted. Additional awards from 1995 to 1998 by OAM (NCCAM’s predecessor) for testing magnetic mattress pads (funding unknown) involved 111 persons with fibromyalgia.

Visually Evoked Potentials (VEP) are on the order of microvolts. Thus in another room 14.5 meters away this signal would be reduced by a factor of several hundred. Any information transfer from an optically stimulated EEG signal in a subject 14.5 meters away would clearly be a non-human adaptation. A simpler and more cost effective experiment could have been measurement of an auditory evoked potential—two sound-proof rooms 14.5 meters apart with the signal being the human voice transferring information to a recipient with head muffs and electrodes attached to his skull. If this pair is truly specially endowed, then they should enjoy careers at Blackjack tables in Las Vegas and be eligible to win the James Randi Educational Foundation's Million Dollar Paranormal Challenge.

Not deterred by lack of evidence, NCCAM engages in both subliminal and direct marketing for CAM. Subliminally, through awards totaling twenty million dollars for development of CAM curriculum in medical schools. A study of these awards published in 2009 in *Academic Medicine* (Marcus and McCullough 2009) concluded that these curricula fail to meet the generally accepted standards of evidence-based medicine. Examples of direct marketing are grants to institutions, such as the Cleveland Clinic, and individuals. Although there is scientific acknowledgment that distance healing is not a valid medical intervention, nevertheless in 2010 NCCAM awarded a Fort Worth consultant for "large corporations and small businesses" \$188,000. His aim was "to build, test, and disseminate an Internet-based wellness program that gives instruction, guidance, and social support for the self-care practice of Qigong."

Congressional misconceptions continue to drive the industry and place a veneer of respectability on CAM. In June

2011, Senator Bernie Saunders (I-VT) sponsored a conference on Complementary and Alternative medicine—"Taking Control of Your Health"—featuring speakers and workshops offering complimentary hands-on sessions. The director of NCCAM, Josephine P. Briggs, MD, was a featured speaker.

Ratcheted up by mandated coverage of alternative medicine in the health care bill, America's thirty-four billion dollar alternative medicine industry is poised to take advantage of the congressional mandate. State licensed health care practitioners such as chiropractors are adding acupuncture and distance healing to their practices. NIH has fueled the process by using federal funds for grants for market plans for the industry.

On June 13, 2011, Lawrence Lindner reported in the *Washington Post* that Congress has proposed ending a program providing federal funding to train 40 percent of pediatricians and pediatric specialists. The pediatric resident training program, which costs \$300 million, has been in place since 1999, almost as long as congressional funding for alter-

native medicine, a program that is not being scrutinized by Congress or the administration.

After nearly twenty years of funding, a paucity of reported results for clinical trials, and no discoveries that would lead to new areas of scientific medical research or treatment, it is surprising that Congress has not recognized that taxpayers are funding a fruitless endeavor. ■

#### Acknowledgments

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#### Notes

1. Recent publications relating to this subject by the author include:

Eugenie Mielczarek and Derek Araujo. 2011. Power lines and cancer, distant healing and health care." *SKEPTICAL INQUIRER* 35(3) (May/June): 40–44.

Eugenie Mielczarek. 2010. Magnetic fields, health care, alternative medicine and physics. *Forum on Physics and Society Newsletter* (April). Available online at [www.aps.org/units/fps/newsletters/201004](http://www.aps.org/units/fps/newsletters/201004).

Eugenie Mielczarek and Derek Araujo. 2009. A fracture in our health care: Paying for non-evidence based medicine (September 28). Available

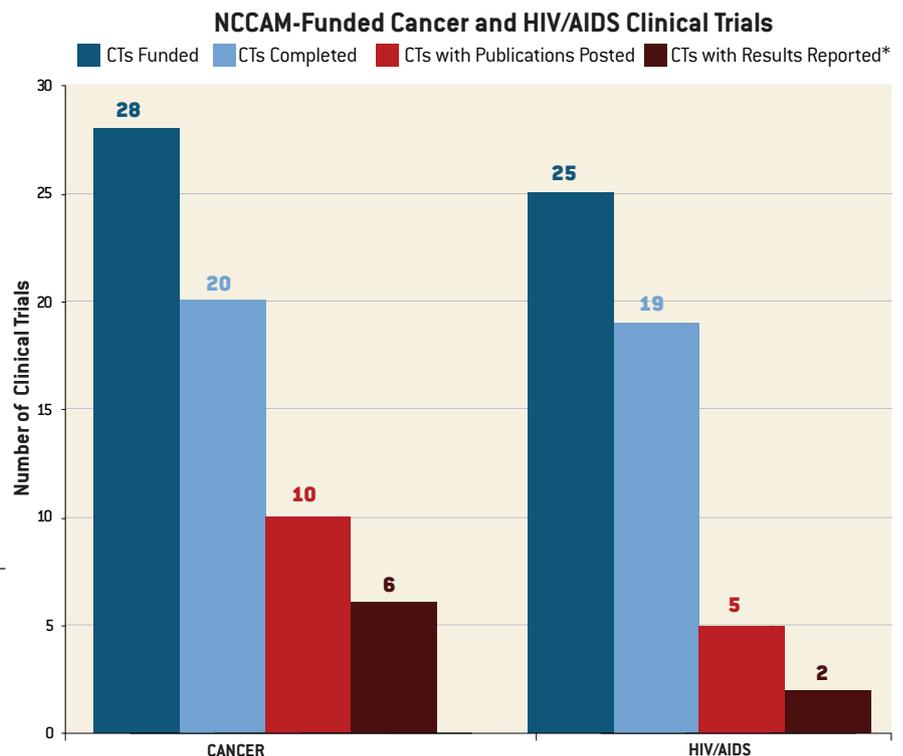


Figure 4: Clinical trials for two serious medical conditions. Fifty-three clinical trials for cancer and HIV/AIDS from 1998–2009 involved over 5,200 persons. No results were posted on ClinicalTrials.gov for any of the twenty completed trials in cancer. Publications were linked to only ten of these twenty-eight cancer studies. A literature search by the authors located some conclusions in six of them.

\* No results were specifically reported on the ClinicalTrials.gov's website, but some results were gleaned from a review of study-related publications.

online at [Paying\\_for\\_Non-Evidence\\_Based\\_Medicine.pdf](#).

Eugenie Mielczarek. 2010. Fields, alternative medicine and physics (blog post). *Science-Based Medicine* (May 27). Available online at [www.sciencebasedmedicine.org/?cat=11](http://www.sciencebasedmedicine.org/?cat=11).

2. Data from grants and clinical trials referred to in this paper can be accessed online at <http://projectreporter.nih.gov/reporter.cfm> and <http://clinicaltrials.gov/>.

3. Examples of institutions that give false respectability to integrative medicine:

Brigham and Women's Hospital (affiliated with Harvard University; [www.brighamandwomens.org/default.aspx](http://www.brighamandwomens.org/default.aspx))

Cleveland Clinic Wellness Institute (<http://my.clevelandclinic.org/departments/integrativemedicine/default.aspx>)

Scripps Institute ([www.scripps.org/services/integrative-medicine](http://www.scripps.org/services/integrative-medicine))

University of Michigan ([www.med.umich.edu/umin](http://www.med.umich.edu/umin))

4. Independent Investigations Group Washington DC (<http://iigdc.org/>).

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Patient Protection and Affordable Care Act: Pub. L. 111–48, 124 Stat. 119 Sec 2706. March 23, 2010.

Qigong Institute. N.d. List of NIH grants for Qigong, Zen, Taiji, and Reiki. Available online at [www.qigonginstitute.org/html/usgovernment.php](http://www.qigonginstitute.org/html/usgovernment.php).

Spence L.A., E.R. Lipscomb, J. Cadogan, et al. 2005. The effect of soy protein and soy isoflavones on calcium metabolism in postmenopausal women: A randomized crossover study. *American Journal of Clinical Nutrition* 81(4)(April): 918–22.

Standish, L.J., L. Kozak, L. Clark Johnson, et al. 2004. Electroencephalographic evidence of correlated event-related signals between the brains of spatially and sensory isolated human subjects. *Journal of Alternative & Complementary Medicine* 10(2)(April): 307–14.

Richards, Todd L., L. Kozak, L. Clark Johnson, et al. 2005. Replicable functional magnetic resonance imaging evidence of correlated brain signals between physically and sensory isolated subjects. *Journal of Alternative & Complementary Medicine* 11(6): 955–63.

Waldman, Hilary. 2008. The right touch: A hint of hands-on healing. *Hartford Courant* (July 28). Available online at [http://articles.courant.com/200807-28/news/healing-toart\\_1\\_healing-touch-therapeutic-touch-therapies](http://articles.courant.com/200807-28/news/healing-toart_1_healing-touch-therapeutic-touch-therapies).



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## Answers to Quiz

The correct answers with grant or clinical trial identifiers (in parentheses):

1. k **Atherosclerosis**, Reiki (1R21AT001100-01)
2. c **Brain Cancer-Glioblastoma**, distance healing prayer (NCT00029783)
3. h **Carpal tunnel syndrome**, static magnetic fields (NCT00521495)
4. i **Cervical Cancer**, therapeutic touch (NCT00084123)
5. e, n **Breast Cancer**, shark cartilage (NCT00026117), flaxseed (NCT00612560)
6. b, q **Diabetes**, expressive writing (NCT00233142), Vedic medicine (NCT 00065650)
7. h **Fibromyalgia**, static magnetic fields (1F31AT000058)
8. a, p **Hepatitis C**, herbs (NCT00010816), milk thistle (NCT00030030)
9. c, d **HIV/AIDS**, prayer (NCT00079534), mushroom extract (NCT00376415)
10. h **Migraine**, static magnetic fields (NCT00665236)
11. g **Multiple Sclerosis**, selenium plus vitamin E (NCT00010842)
12. k, g, j, l **Prostate Cancer**, Reiki (NCT00065208), selenium plus vitamin E (NCT00006392), soy compounds (NCT00200824), mistletoe (NCT00049608)
13. f **Rheumatoid Arthritis**, pulsed magnetic fields (NCT00110565)
14. c **Wound Healing**, prayer (NCT00067717)
15. m **Head and Neck Cancer**, acupuncture (NCT00797732)
16. m **Cardiovascular disease**, acupuncture (NCT00032422)
17. o **Temporomandibular Joint Disorder**, shamanic healing (NCT 00071474)