THE JOURNAL OF ALTERNATIVE AND COMPLEMENTARY MEDICINE
Volume 10, Number 4, 2004, pp. 597–606

LETTERS TO THE EDITOR

FROM A HEALER TO SCIENTISTS: ON DUALITY

Dear Editor:

In a society in which what is normal is to teach one thing and do another, it should not be surprising that schizophrenia continues to resist the best efforts of medicine, psychiatry, philosophy, and religion.

Larry Dossey, M.D., prefaced his *Beyond Illness: Discovering the Experience of Health* (1984) with the paragraph:

> There are some thoughts that physicians early on learn to keep to themselves. They have mainly to do with concepts that have not survived the unforgiving scrutiny of science and which have therefore faded from our list of respectable concerns in the profession. They have to do with spirit. The mention of the word immediately causes the deepest furrowing of the scientific brow.

Fritjof Capra wrote in his introduction to Dossey's *Space, Time and Medicine* (1982): "As an alternative to the current medical model, Dr. Dossey develops the outlines of a 'space-time model' of health that is in agreement with the view of reality suggested by modern physics." Capra guided Dossey, saying that: "We must help him (the patient) realize that he is a process in spacetime."

In a 1995 invited essay for the Institute of Noetic Sciences, Edgar Mitchell (1995) wrote:

> The name "dyadic" derives from observing that an impressive number of dualisms in descriptions of reality are in fact complementary, inseparable attributes of matter, such as wave, particle, mind/body, yin/yang, etc. . . . They are coupled because in our universe, at least, they always seem to be found together when we attempt to describe process. The subjective experience of an entity undergoing process may encounter but one aspect of a dyadic pair at a time, however. For example, in a learning, trial and error universe, the limits to the outcome of any process may be labeled a success or failure, but an aware entity will only experience one or the other.
>
> Both cannot be experienced together simultaneously. However, for a broader perspective both aspects exist and they are connected as one implies the other.

In 1936, Bleuler coined the term schizophrenia, which literally means "split mind." Yet, what is split is not the totality of the mind (as in creating two separate personalities) but the relationship the person with schizophrenia has with him or herself, resulting in a division between psychologic processes that are normally experienced as integrated: thought and the thinker; mind and body; good self and bad self; and time and logical sequence. The person suffers from extremes of keen perceptiveness to loss of perception, and the ability to be consummately creative and inability to function at all. The person appears to suffer from a separation of the self in the mind-body on earth, the self which is being developed, from the self which is perceived to be and is in a distant part of the universe the person longs to be rejoined with, perceiving that higher self, the soul, the true self to be incapable of living in a fallen state in a fallen world. The desire to escape this world rather than to change it, to serve it, and thereby to advance one's soul while still on earth, is what accounts for the high suicide rate among schizophrenics and for their destructive, detached behaviors in their struggle to fulfill their time on earth.

It is my own belief that every schizophrenic is a medium, an intermediary between worlds, between spiritual and cosmic dimensions. While mediumship, like other psychic abilities, is a natural function intended, when exercised judiciously, to benefit both message receiver and message sender, the sad fact is that people wishing to escape the responsibilities and challenges of relationships with people in bodies on earth, resort to substituting relationships with discarnate beings, many of whom are at very low spiritual levels and who parasitically use the energy of their prey on earth to continue manipulative and destructive behaviors carried over from their own incomplete spirit journeys here. Many of these spirits are very entertaining, especially for people without relationships and responsibilities. Most importantly, they feed the ego, tell the person what he or she *wants* to hear, not what he or she *needs* to hear.

True guidance from the Divine Mind, or, at worst, from evolved spirits in service to the Divine Mind for such situations, is not discerned in the cacophony of preferred voices the psychiatric profession continues to refer to as hallucinations. When psychotropic drugs are administered to deal with these "hallucinations," the person is not encouraged to evolve spiritually in order to avoid interference and never receives confirmation from an unrealistic culture that survival continues beyond the body. The person mistrusts his or her own direct experience and also mistrusts the experience of the professionals he or she depends on for help. Dis-

association becomes worse for the growing number of patients unsuited for medication and, as we hear increasingly in the news, the side-effects of antipsychotic and antidepressive drugs include suicide.

What is not calculated, in fact what may be incalculable, is the cost in human life of mediums who learn to turn to socially respectable suicides such as cancer and heart disease.

In the early 1970s, I had the privilege of being the first healer paid by the state of New York. My work was to demonstrate what healing could do with patients who had acute or chronic schizophrenia and who were incarcerated in mental hospitals, one of which was Creedmoor Psychiatric Institute in New York's borough of Queens. Violent patients were kept behind locked doors not opened even for meals, which were shoved into a slit at the bottom of each heavy metal door. Some patients had not seen daylight in years. A 15-year-old son of a minister from Philadelphia was thrown in with people who were purported to be hardened criminals who were "lucky not to be in jail."

My first patient was the 30-year-old son of a Creedmoor trustee who, because of his wealth, had been permitted to build separate quarters for his son on state premises. His son, diagnosed as paranoid schizophrenic, was reputed to have an "organic brain impairment." The trustee had brought his son to my office for *one* treatment, which had resulted in the end of the schizophrenic condition and which led to our collective view that there had been a tragic misdiagnosis 25 years earlier. I then was asked to do similar work with other "hopeless" patients at Creedmoor since, just at that time, the state began to reward its institutions on a per head basis for emptying the schizophrenic wards rather than for keeping them full. Patients on the back wards responded to my love and to my touch. Many were released who remained in service to my vocation for many years.

At the same time I was consulting for Creedmoor Psychiatric, I had the opportunity to meet with a philanthropist from Toronto, Canada, who became the first funder of Rupert Sheldrake and of the American Schizophrenia Foundation (ASF) headed by the renowned British-Canadian team of Hoffer and Osmond, working with Linus Pauling in orthomolecular psychiatry and medicine. My husband became the Director of the Huxley Institute for Biosocial Research, the outgrowth of the ASF, and I became its first Consultant. Dr. Osmond, although committed to the orthomoleccular approach, understood fully that patients with schizophrenia were the most spiritual of the population and also the most psychic but that the refusal to obey the Divine Mind for service rather than spirits (small 's') in ego accounted for the inevitable turning of the psychic gifts inward against self and society.

Orthomolecular psychiatry was premised on the idea that every person is a biochemical individual. My work was to persuade Dr. Pauling and his associates that the biochemistry of schizophrenia was the *result* not the cause of deference to spirits rather than to Spirit. As patients became more and more spiritual, they required less and less medication and exhibited behaviors well within the normal range and became much better by far.

While I was glad that megadoses of B and C vitamins, excreted in urine, were being prescribed in lieu of the usual tranquilizers, I understood that, particularly for the group appropriate for vitamins, it was essential for patients to make a spiritual change making even vitamins unnecessary.

We ourselves, as a culture, must move from the dualism of materialism/spirituality to a culture of dyadism in which we recognize the good and evil in the practitioner as well as the patient, in seeing as Mitchell put it, a broader perspective for perceiving what is called success or failure (Mitchell, 1995). As Dossey suggested we must enable patients to understand that in an evolving cosmos, we are all space-time processes (Dossey, 1982).

REFERENCES

Bleuler E. Textbook of Psychiatry. New York: Macmillan, 1936.
Capra F. Introduction In: Dossey L [author]. Space, Time and Medicine. Boulder, CO & London: Shambala, 1982.
Dossey L Beyond Illness: Discovering the Experience of Health. Boston: New Science Library, 1984.
Mitchell M. A Dyadic Model of Consciousness. [invited essay for the Institute of Noetic Sciences]. In: World Futures, vol. 46. Amsterdam: Gordon and Breach Science Publishers, 1995;69–78.

Address reprint requests to:
Suzanne Mendelssohn, Ph.D.
P.O. Box 485
Shelter Island, NY 11965

E-mail: FundrPublicInter@aol.com

COMMENTS ON THE ENERGY ISSUE

Dear Editor:
I have some comments on the special issue of the *Journal*, published this past February (Jobst et al., 2004) as follows:

• *Emoto Photoessay*—The morphology of ice crystals is well known to depend strikingly upon (1) the supercooling of the water, ΔT, below its equilibrium freezing point, (2) the concentration and specific nature of the solute species (contaminants) present in the water, and (3) the actual supercooling, ΔT^*, at which some heterogeneous catalytic particle present in the water initiates the ice-crystal nucleation event (Tiller, 1991a, 199b). It is also possible that subtle energies can influence both the phase equilibrium and the phase transformation kinetics for the water $\leftrightarrows$ ice reaction as Dr. Emoto implies. However, to actually prove this latter point, it will be necessary to refine Dr. Emoto's technique. Item (1) above can stay as it is but it will be necessary to actually know the water temperature at which ice nucleation occurs. Item (2) above requires replacing the test

water with high performance liquid chromatography-type or other very-high purity water. Item (3) must be controlled by initiating the crystal nucleation event at the same ΔT^* for all experiments. In the past, this has been done either by (1) seeding the supercooled water via the injection of very small ice crystals or (2) by inserting a tiny "cold" tube of glass maintained at ($\Delta T + 1\ \Delta T^*$) so that crystals always nucleate first on the surface of this thin tube.

This comment is meant as constructive criticism for investigators who might choose to utilize this technique exactly as Dr. Emoto has, as a satisfactory method for *scientifically proving* the qualitative and quantitative impact of subtle energies on physical reality. For such a goal, it is not satisfactory in its present form. However, it is indeed curiously interesting that the various emotional intentions, and the various kinds of music utilized by Dr. Emoto, probably modulated item (3) above to secondarily generate the variety of ice crystal morphologies he observed.

• *Liboff article "Toward an Electromagnetic Paradigm for Biology and Medicine"*—This is an excellent article but limits itself to conventional electromagnetism à la conventional Maxwell's equations even though he states, without proof, on page 45 that "every living organism is completely described by an electromagnetic field vector, π, that is specifically determined by a transformation from the genome." The very serious limitation here is that human and perhaps all vertebrate bioelectromagnetism is a mix of the conventional U(1) electromagnetic (EM) gauge symmetry state (Maxwell-type EM) and the higher SU(2) EM gauge symmetry state that involves both electric monopole sources *and* magnetic monopole sources. This can be easily proven by showing that a south pole direct current (DC) magnetic field placed close to a muscle group on a human strengthens that muscle group while a north pole weakens the same muscle group (Tiller et al., 2004a; Tiller, 2004). Such a DC magnetic field polarity effect can only come from accessing a magnetic monopole field which, in turn, is present at the higher SU(2) EM gauge level.

• *Korotkov et al. "Assessing Biophysical Energy Transfer Mechanisms in Living Systems: The Basis of Life Processes"*—These authors have done an excellent job in describing how solar photons drive important electronic and chemical processes critical to the storage and on-demand release of thermodynamic free energy essential to life processes. I would ask them to consider other EM photon sources within the human body that can also serve in place of the sun. As shown earlier, the human acupuncture meridian/chakra system is at a substantially higher EM gauge symmetry level (perhaps SU(2)) than the rest of the body and is at a higher thermodynamic free energy per unit volume state than the rest of the body (Tiller et al., 2004; Tiller, 2004a). Thus, there is a thermodynamic driving force existing wherein *qi* or magnetoelectric energy photons (Tiller et al. 2001) can transfer to and excite conventional atomic and molecular orbital states in a similar way as do solar photons. Furthermore, it is interesting to note that human consciousness (intention) from a deep meditative state can imprint a specific intention into a simple low-technology electronic device raising it to a sufficiently high EM gauge symmetry level that this IIED [intention imprinted electrical device] can, in turn, raise a 10^2–10^3 cubic foot room to an EM gauge symmetry level approaching the SU(2) level with its correspondingly raised thermodynamic free energy per unit volume. Here, perhaps for the first time, we see a *consciousness-driven* process that results in a decrease of entropy production and an increase in thermodynamic free energy (Tiller et al., 2001, 2003).

• *Jonas and Chez in "Education, Initiatives, and Information Resources"*—For this paper, I think that it is important to add the following three perspectives,

(1) There appear to be three categories of scientific investigators when it comes to psychoenergetic phenomena: (i) investigators who are deeply entrained to the unstated assumption of conventional science that no human quality of consciousness, intention, emotion, mind, or spirit can significantly influence a well-designed target experiment. For such folks, the effect size for any psychoenergetic experiment result must be unequivocally zero. Any presentation of psychoenergetic experimental data to this group, with effect sizes greater than zero, will cause their eyes to roll and glaze over just before their conscious brain shuts down. This behavior is labeled the boggle effect in action. (ii) A second category, for which the above paper appears to have been written, is a group who do not suffer the "boggle effect" so long as the psychoenergetic experimental effect sizes are small but who do exhibit the boggle response when the effect sizes are large. This group is entrained with the need for extremely careful controls and sophisticated statistical design of experiments to wean out and discriminate small effect size results from the statistical noise zone of the experiment. This is a very important procedure that needs to be established for new areas of science seeking credibility from the establishment scientists largely populating category (i). However, the downside here for the category ii group is that they often become so entrained by their day-to-day procedures that they cannot accept large effect size psychoenergetic results that do not seem to obey their carefully constructed rules. (iii) A third category of investigators comprise those who never experience the boggle response no matter how large the result effect size of the psychoenergetic experiments being conducted. For them, key experimental design protocols need to be such that the dominant physics principles operating in the experiment are sufficient to manifest data signals of magnitudes strongly above the noise (i.e., large effect sizes). We always need to keep this in mind as we evolve into a new era in medicine.

(2) *Consider this act of consciousness*: 2,4, or 6 humans sit around a table. A UED [unimprinted electrical device] and its power transformer lie on the tabletop, plugged into a wall voltage source, plugged into each other, and switched on. The humans go into a deep meditative state and mentally/emotionally hold a specific intention to be imbed-

ded in/linked to this device. After such consciousness processing, a shielded device is shipped via Federal Express to a laboratory ~1500 miles away and turned on in a room containing a continuous running conjugate target experiment, yielding material property measurements of the type identified in the specific intention held by the aforementioned meditators. After ~2–3 months, the magnitude of the specific property measurement under test changes over time in three ways: (i) the change is in the *direction* of the specific intention; (ii) the magnitude of total change is equal to or close to that requested in the specific intention; and (iii) relative to the basic measurement accuracy of the experimental system, the change "effect size" is large.

This consciousness-processed device, labeled an IIED has acquired a type of intelligence or internal program (not of the usual software type) allowing it to raise the electromagnetic gauge symmetry state of the space housing the target experiment, which also means that the device raises the thermodynamic free energy per unit volume of that space, and thereby is able to manifest the experimentally determined material property changes requested by the specific intention held by the initial meditators.

This IIED-manifested consciousness appears to exhibit a capacity or property closely allied with a creation/annihilation process rather than just an attending to, an awareness of, an experiencing of, etcetera, type of capacity presented to us in the box labeled definitions of the subject paper. This newly discriminated aspect of consciousness is real and is better associated with a reaction equation of the following type:

$$\text{Mass} \rightleftarrows \text{Energy} \rightleftarrows \text{Consciousness} \qquad (1)$$

than just the limited perspective given in the subject paper. The equation/aspect of consciousness represents it as a uniquely distinguishable quality from mass or energy but able to create changes in energy, and thus mass, states and probably can be quantitatively convertible to these other fundamental properties of nature.

For our collective path forward, it is very important that we not "throw the baby out with the bath water" by constraining ourselves to narrow definitions of topics that we know very little about or of nature's processes that we currently know very little about. We are very far away from being able to write a "theory of everything" (TOE) in the general area of psychoenergetics research (which includes healing research).

(3) *Consider the concept of an experimental control:* If the space wherein experiments are conducted is at the U(1) electromagnetic (EM) gauge symmetry level, then it is quite possible to have a "control" site or relatively isolated "placebo" involved in the experiment. However, if the experimental space has been raised to an appreciably higher EM gauge symmetry level, the SU(2) level for example, then the situation is quite different. Our experimental data (Tiller et al., 2004b, 2004c) indicates that a strong information entanglement process develops between all parts of the experimental system and that supposed control sites exhibit almost the same type of behavior as at the designated experimental site. To date, we have found no material that can shield the control site from this information entanglement process.

The key point here is that, if one is satisfied with small effect size results then "controls" and "placebos" can probably be useful in the experimental design. However, if one wishes large effect size results, the higher EM gauge operating physics with its strong information entanglement process seems to negate the usefulness of control sites and placebos in the experimental design.

REFERENCES

Jobst KA, Niemtzow RC, Curtis BD, Curtis ML, eds. Special Issue on Science and Healing: From Bioelectromagnetics to the Medicine of Light. J Altern Complement Med 2004;10:1–222.

Tiller WA. The Science of Crystallization: Microscopic Interfacial Phenomena. Cambridge, UK: Cambidge University Press, 1991a.

Tiller WA. The Science of Crystallization: Macroscopic Phenomena and Defect Formation Cambridge, UK: Cambridge University Press, 1991b.

Tiller, WA. Towards a quantitative science and technology that includes human consciousness. Vision-In-Action (VIA) Magazine 2003 1:30–43.

Tiller WA. Subtle energies and their roles in bioelectromagnetic phenomena. In: Rosch PT, Markov M, eds. Clinical Aspects of Bioelectromagnetic Medicine. New York: Marcel Dekker, 2004:159–205.

Tiller WA., Dibble Jr WE, Kohane MJ. Conscious Acts of Creation: The Emergence of a New Physics. Walnut Creek, CA: Pavior Publishing, 2001.

Tiller WA, Dibble Jr WE, Krebs CT. Instrumental response to advanced kinesiology treatments in a "conditioned" space. Subtle Energy Energy Med (2004a), 13:91–108.

Tiller WA, Dibble Jr WE, Nunley RE, Chealy CN. Toward general experimentation and discovery in conditioned laboratory spaces: Part I: Experimental pH-change findings at some remote sites. J Altern Complement Med 2004b;10:145–157.

Tiller WA, Dibble Jr WE, Shealy CN, Nunley RE. Toward general experimentation and discovery in "conditioned" laboratory spaces: Part II. pH-change experience at four remote sites 1 year later. J Altern Complement Med 2004c;10:301–306.

Address reprint requests to:
William A. Tiller, Ph.D.
The William A. Tiller Foundation for New Science
909 South Pinecone Street
Payson, AZ 85541-5731

E-mail: bill@tiller.org

PROBIOTICS IN THE PREVENTION AND TREATMENT OF DIARRHEA

Dear Editor:

Humans are born without any microorganisms inhabiting their gastrointestinal tract. Soon thereafter, strains of bacteria colonize the lining of the digestive system and become an integral part of helping to maintain a person's health. There are several strains of bacteria that can be found in an average human's body. Some of the better known strains are *Lactobacillus*, *Bifidobacterium*, *Streptococcus*, and *Escherichia coli*. Some bacteria have been found to be useful in treating specific diseases. These particular microorganisms are known as probiotics, also known as "good gut" bacteria. They have been used in the treatment of diarrhea (Arvola et al., 1999; Saavedra, 2000; Vanderhoof et al., 1999), allergic symptoms (Majamaa and Isolauri, 1997), and eczema (Malin et al., 1996; Pelto et al., 1998; Ruseler-van Embden et al., 1995). Some preliminary work has also been done with cancer (Goldin et al., 1996; Gorbach, 2000).

We performed a systematic review of the literature looking at the question of whether probiotics were effective in the prevention and treatment of diarrhea. Using the subject headings and keywords "probiotics" and "diarrhea," literature searches were completed in MEDLINE™, PubMed, Cochrane Controlled Trials register, and the Cochrane Database of Systematic reviews. Both authors independently reviewed all abstracts. All double-blinded randomized controlled trials regarding probiotics in the prevention or treatment of diarrhea were retrieved and these became the basis of the review.

There were 157 articles, of which 20 were randomized clinical trials for review. The findings from these are listed in Table 1. Diarrhea was defined as three or more watery stools per day. Subjects with bloody diarrhea or diarrhea caused by an invasive organism, such as salmonella or shigella, were excluded from the studies.

Probiotics are remarkably safe. In the 20 studies involving 2,685 patients, there were no reports of major side-effects with any probiotic.

There were 11 trials that tested the use of probiotics against diarrhea in children. When tested, the use of probiotics reduced the average length of hospital stay for gastroenteritis by 1 day. Probiotics were consistently much more effective in reducing diarrhea in children who were infected with rotavirus (Guandalini et al., 2000; Guarino et al., 1997; Rautanen et al., 1998; Simakachorn et al., 1990). This was true no matter what probiotic was used. Lactobacillus GG was the most extensively studied probiotic for this condition. Studies also showed effectiveness of probiotics against both antibiotic associated diarrhea and traveler's diarrhea (Oksanen et al., 1990; Vanderhoof et al., 1999).

In conclusion, probiotics are safe and effective in the prevention and treatment of watery diarrhea. They are especially effective in children under the age of 5 with Rotavirus infection. Lactobacillus GG is the most extensively studied probiotic. There is strong evidence to support the expanded use of probiotics in the treatment of watery diarrhea in young children, in the prevention of traveler's diarrhea in adults, and in the prevention of antibiotic-associated diarrhea. More research needs to be done so as to specify the appropriate probiotic strain and the appropriate dose of that strain for the various conditions that can be effectively treated with probiotics.

REFERENCES

Arvola T, Laiho K, Torkkeli S, Mykkanen H, Salminen S, Maunula L, Isolauri E. Prophylactic *Lactobacillus* GG reduces antibiotic-associated diarrhea in children with respiratory infections: A randomized study. Pediatrics 1999;104:e64.

Goldin BR, Gualtieri LJ, Moore RP. The effect of *Lactobacillus* GG on the initiation and promotion of DMH-induced intestinal tumors in the rat. Nutr Cancer 1996;25:197–204.

Gorbach SL. Probiotics and gastrointestinal health. Am J Gastroenterol 2000;95(1 Suppl):S2–4.

Guandalini S, Pensabene L, Zikri MA, Dias JA, Casali LG, Hoekstra H, Kolacek S, Massar K, Micetic-Turk D, Papadopoulou A, de Sousa JS, Sandhu B, Szajewska H, Weizman Z. *Lactobacillus* GG administered in oral rehydration solution to children with acute diarrhea: A multicenter European trial. [see comments]. J Pediatr Gastroenterol Nutr 2000;30:54–60.

Guarino A, Canani RB, Spagnuolo MI, Albano F, Di Benedetto L. Oral bacterial therapy reduces the duration of symptoms and of viral excretion in children with mild diarrhea. J Pediatr Gastroenterol Nutr 1997;25:516–519.

Isolauri E, Juntunen M, Rautanen T, Sillanaukee P, Koivula T. A human Lactobacillus strain (*Lactobacillus casei* sp strain GG) promotes recovery from acute diarrhea in children. Pediatrics 1991;88:90–9.

Lee MC, Lin LH, Hung KL, Wu HY. Oral bacterial therapy promotes recovery from acute diarrhea in children. Acta Paediatr Taiwan 2001;42:301–305.

Lewis SJ, Potts LF, Barry RE. The lack of therapeutic effect of *Saccharomyces boulardii* in the prevention of antibiotic-related diarrhoea in elderly patients. J Infect 1998;36:171–174.

Majamaa H, Isolauri E. Probiotics: A novel approach in the management of food allergy. J Allergy CLin Immunol 1997;99:179–185.

Malin M, Suomalainen H, Saxelin M, Isolauri E. Promotion of IgA immune response in patients with Crohn's disease by oral bacteriotherapy with *Lactobacillus* GG. Ann Nutr Metab 1996;40: 137–145.

Oberhelman RA, Gilman RH, Sheen P, Taylor DN, Black RE, Cabrera L, Lescano AG, Meza R, Madico G. A placebo-controlled trial of Lactobacillus GG to prevent diarrhea in undernourished Peruvian children. J Pediatr 1999;134:15–20.

Oksanen PJ, Salminen S, Saxelin M, Hamalainen P, Ihantola-Vormisto A, Muurasniemi-Isoviita L, Nikkari S, Oksanen T, Porsti I, Salminen E, et al. Prevention of travellers' diarrhoea by Lactobacillus GG. Ann Med 1990;22:53–56.

Pant AR, Graham SM, Allen SJ, Harikul S, Sabchareon A, Cuevas L, Hart CA. *Lactobacillus* GG and acute diarrhoea in young children in the tropics. J Trop Pediatr 1996;42:162–165.

Pearce JL, Hamilton JR. Controlled trial of orally administered lactobacilli in acute infantile diarrhea. J Pediatr 1974;84:261–262.

Pelto L, Isolauri E, Lilius EM, Nuutila J, Salminen S. Probiotic bacteria down-regulate the milk-induced inflammatory response in milk-hypersensitive subjects but have an immunostimulatory effect in healthy subjects. Clin Exp Allergy 1998;28:1474–1479.

Rautanen T, Isolauri E, Salo E, Vesikari T. Management of acute

Table 1. Review of Randomized Controlled Trials of the Effect of Probiotics on Diarrhea

Author	*Probiotic*	*Dose*	n	*Age*	*Outcome measure*	*Results*
Guandalini et al.	*Lactobacillus* GG	10^{10} CFU/250 mL	287	1 month–3 years	Duration of diarrhea	Rotavirus (+) $p < 0.008$ Rotavirus (−) $p < 0.03$
Guarino et al.	*Lactobacillus* GG	6×10^9 CFU/400 mL	100	3 months–36 months	Duration of diarrhea	Rotavirus (+) $p < 0.01$
Isolauri et al.	*Lactobacillus* GG	2×10^{11} CFU/day	71	4 months–45 months	Duration of diarrhea	$p < 0.001$
Lee et al.	*Lactobacillus acidophilus* *Bifidobacterium infantis*	3×10^9 CFU/day	100	6 months–60 months	Duration of diarrhea	$p < 0.01$
Lewis et al.	*Saccharomyces Boulardi*	266 mg/day	69	Over age 65 years	Incidence of diarrhea	p = NS
Oberhelman et al.	*Lactobacillus* GG	3.7×10^{10} CFU/day	204	6 months–24 months	Incidence of diarrhea	$p = 0.028$
Oksanen et al.	*Lactobacillus* GG	2×10^9 bacteria/day	756	10–80 years	Prevention of travelers' diarrhea	$p = 0.02$
Pant et al.	*Lactobacillus* GG	10^{10} CFU/20 mL	39	1–24 months	Duration of diarrhea	$p < 0.05$
Pearce and Hamilton	*Streptococcus thermophilus, lactis;* *Lactobacillus acidophilus;* *Lactobacillus bulgaricus*	3×10^8 viable bacteria/day	94	0–36 months	Duration of diarrhea	p = NS
Rautanen et al.	*Lactobacillus* GG	10^{10} CFU/day	123	6–36 months	Duration of diarrhea	Rotavirus (+) $p = 0.06$ Rotavirus (−) $p = 0.29$ (NS)
Raza et al.	*Lactobacillus* GG	10^{10} CFU/20 mL	40	1–24 months	Duration of diarrhea	$p < 0.01$
Rosenfeldt et al.	*Lactobacillus Rhamnosus* and *Lactobacillus reuteri*	10^{10} CFU	69	24–60 months	Length of hospitalization	$p < 0.03$
Rosenfeldt et al.	*Lactobacillus Rhamnosus* and *Lactobacillus reuteri*	10^{10} CFU	75	24–60 months	Duration of diarrhea	$p < 0.02$
Saavedra et al.	*Bifidobacterium bifidum*; *Streptococcus thermophilus*	2.7×10^8 CFU/100 mL	55	5–24 months	Incidence of diarrhea	$p = 0.035$
Shornikova et al.	*Lactobacillus reuteri*	10^{10} CFU/150 mL	40	6–36 months	Duration of diarrhea	Trend toward decreased duration $p = 0.07$ (NS)
Siitonen et al.	*Lactobacillus* GG	250 mL active LGG in yogurt	16	18–24 years	Incidence of diarrhea caused by erythromycin	$p < 0.05$
Simakachorn et al.	*Lactobacillus acidophilus LB*	2×10^{10} bacteria/day	73	3–24 months	Duration of diarrhea	Rotavirus (+) $p = 0.012$ Rotavirus (−) $p = 0.034$
Szajewska et al.	*Lactobacillus* GG	1.2×10^{10} CFU/day	81	1–36 months	Prevention of nosocomial diarrhea	$p = 0.002$
Urbancsek et al.	*Lactobacillus rhamnosus*	4.5×10^9 CFU/day	205	19–75 year old cancer patients	Prevention of radiotherapy induced diarrhea	p = NS
Vanderhoof et al.	*Lactobacillus* GG	10^{10} CFU/day	188	6–10 years	Prevention of antibiotic associated diarrhea	$p < 0.02$

diarrhoea with low osmolarity oral rehydration solutions and *Lactobacillus* strain GG. Arch Dis Child 1998;79:157–160.
Raza S, Graham SM, Allen SJ, Sultana S, Cuevas L, Hart CA. *Lactobacillus* GG promotes recovery from acute nonbloody diarrhea in Pakistan. Pediatr Infect Dis J 1995;14:107–111.
Ruseler-van Embden JG, van Lieshout LM, Gosselink MJ, Marteau P. Inability of *Lactobacillus casei* strain GG, *L. acidophilus*, and *Bifidobacterium bifidum* to degrade intestinal mucus glycoproteins. Scand J Gastroenterol 1995;30:675–680.
Rosenfeldt V, Michaelsen KF, Jakobsen M, Larsen CN, Moller PL, Pedersen P, Tvede M, Weyrehter H, Valerius MH, Paerregaard A. Effect of probiotic *Lactobacillus* strains in young children hospitalized with acute diarrhea. Pediatr Infect Dis J 2002;21:411–416.
Rosenfeldt V, Michaelsen KF, Jakobsen M, Larsen CN, Moller PL, Tvede M, Weyrehter H, Valerius NH, Paerregaard A. Effect of probiotic *Lactobacillus* strains on acute diarrhea in a cohort of nonhospitalized children attending day-care centers. Pediatr Infect Dis J 2002;21:417–419.
Saavedra J. Probiotics and infectious diarrhea. Am J Gastroenterol 2000;95(1 Suppl):S16–18.
Saavedra JM, Bauman NA, Oung I, Perman JA, Yolken RH. Feeding of Bifidobacterium bifidum and Streptococcus thermophilus to infants in hospital for prevention of diarrhoea and shedding of rotavirus. Lancet 1994;344:1046–1049.
Shornikova AV, Casas IA, Isolauri E, Mykkanen H, Vesikari T. *Lactobacillus reuteri* as a therapeutic agent in acute diarrhea in young children. J Pediatr Gastroenterol Nutr 1997;24:399–404.
Siitonen S, Vapaatalo H, Salminen S, Gordin A, Saxelin M, Wikberg R, Kirkkola AL. Effect of *Lactobacillus* GG yoghurt in prevention of antibiotic associate diarrhoea. Ann Med 1990;22:57–59.
Simakachorn N, Pichaipat V, Rithipornpaisarn P, Kongkaew C, Tongpradit P, Varavithya W. Clinical evaluation of the addition of lyophilized, heat-killed *Lactobacillus acidophilus* LB to oral rehydration therapy in the treatment of acute diarrhea in children. J Pediatr Gastroenterol Nutr 2000;30:68–72.
Szajewska H, Kotowska M, Mrukowicz JZ, Armanska M, Mikolajczyk W. Efficacy of *Lactobacillus* GG in prevention of nosocomial diarrhea in infants. J Pediatr 2001;138:361–365.
Urbancsek H, Kazar T, Mezes I, Neumann K. Results of a double-blind, randomized study to evaluate the efficacy and safety of Antibiophilus in patients with radiation-induced diarrhoea. Eur J Gastroenterol Hepatol 2001;13:391–396.
Vanderhoof JA, Whitney DB, Antonson DL, Hanner TL, Lupo JV, Young RJ. *Lactobacillus* GG in the prevention of antibiotic-associated diarrhea in children [see comments]. J Pediatr 1999; 135:564–568.

Chester H. Fox, M.D.
Clinical Center
Buffalo, NY
Gaurav Dang
University of Massachusetts—Amherst
Amherst, MA

Address reprint requests to:
Chester H. Fox, M.D.
Department of Family Medicine
Clinical Center
462 Grinder Street
Buffalo, NY 14215

E-mail: cfox@buffalo.edu

CRANBERRIES AND URINARY-TRACT HEALTH: A KNOWLEDGE ASSESSMENT OF AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS FELLOWS

Dear Editor:

Increasingly, complementary and alternative medicines are finding their way into the American health care system (Eisenberg et al., 1998). While many of these therapies are commercially available and widely used by patients, physicians are frequently uninformed as to the underlying scientific evidence that supports or refutes these nonpharmaceuticals.

The American cranberry (*Vaccinium macrocarpon*) has long occupied a key position in folklore with regards to its beneficial effects on urinary-tract health. To assess physicians' knowledge about the facts and myths of cranberry consumption and urinary-tract infections, we conducted a survey of American College of Obstetricians and Gynecologist (ACOG) Fellows to assess their knowledge in this area of complimentary medicine.

Questionnaires were mailed in January 2003 to 1146 ACOG fellows and junior fellows in practice. Subjects consisted of a computer-generated random sample of ACOG fellows. Questionnaires returned by April 21, 2003 were included in the survey. The following two two-part multiple-choice questions were asked as an addendum to a survey on multiple gestations:

(1) Does cranberry juice consumption help **PREVENT** urinary tract infections?
☐ Yes ☐ No
If yes, by what mechanism does it work? (*Check only one*)
☐ Acidification of the urine
☐ High fructose concentrations
☐ Destruction of bacterial cell walls via free radicals from antioxidants/vitamin C
☐ Inhibition of bacterial adherence to uroepithelium via proanthocyanidins
(2) Does cranberry juice consumption **TREAT** urinary tract infections?
☐ Yes ☐ No
If yes, by what mechanism does it work? (*Check only one*)
☐ Acidification of the urine
☐ High fructose concentrations
☐ Destruction of bacterial cell walls via free radicals from anti-oxidants/vitamin C
☐ Inhibition of bacterial adherence to uroepithelium via proanthocyanidins.

One thousand, one hundred and forty-six (1146) surveys were sent. Four hundred and nineteen (419; 97%) physicians responded to question 1 and 417 (97%) to question 2. Seventy-one percent (71%) of respondents believed cranberry juice could prevent urinary-tract infections but only 32% identified the most appropriate reason. Only 81% of respondents knew that there is no evidence to support the the-

ory that cranberry juice can be used to treat urinary tract infections. The answers are shown in Table 1.

For years, the cranberry's beneficial associations with urinary-tract health were presumed to result from this highly acidic fruit's ability to "acidify" the urine and thereby inhibit bacterial overgrowth. While some early studies supported this mechanism, later investigations determined that the quantities of cranberry juice needed to significantly lower urine pH were well beyond normally consumed volumes. To that end, in 1959, Bodel et al. demonstrated that urine pH was only marginally affected after subjects consumed up to 4 liters of cranberry juice cocktail daily.

Despite the discrediting of the acidification mechanism, repeated studies continued to suggest that consumption of cranberry juice (27% cranberry juice cocktail is the most commonly available commercial product) could reduce the incidence of bacteruria and urinary-tract infections. While the methodology of many of these clinical trials was often suboptimal, in the laboratory, the search for a mechanism by which cranberry juice prevented urinary-tract infections continued. A breakthrough occurred in 1984 when Sobota convincingly demonstrated that the mode of action of cranberry juice was to interfere with the adherence of *Escherichia coli* to uroepithelial cells.

Subsequent to this finding, a more precise understanding of the mechanisms involved has been attained. Bacteria, including *E. coli*, have different types of adhesins on their pili or fimbriae that allow the organism to adhere to epithelial cells and proliferate. Cranberries contain a relatively unique compound called proanthocyanidins (PACs) that inhibit the mannose-resistent (P-fimbriated) adhesins found in strains of *E. coli* and other types of bacteria (Howell et al., 1998). Thus, *in vitro* cranberry juice does inhibit bacteria adherence to uroepithelial cells, and the science is there to explain why.

In vivo, in 1994, Avorn et al. demonstrated that when randomly assigned to cranberry juice consumption versus placebo, elderly women were 42% less likely to have bacteriuria with pyuria than controls (Avorn et al., 1994). In 2001, in a randomized, blinded, placebo-controlled trial, Kontiokari et al. demonstrated that consuming cranberry–lingonberry juice may help prevent urinary tract infections in women with a history of recurrences (Kontiokari et al., 2001) and, in 2002, Stothers showed that consumption of either cranberry juice or cranberry tablets statistically significantly decreased the number of patients experiencing at least one symptomatic urinary-tract infection per year (to 20% and 18%, respectively) compared to placebo (to 32%) ($p < 0.05$). Despite some methodological flaws, these three trials present a compelling clinical complement to the microbiologic and biochemical evidence previously elucidated in the laboratory. The importance of the latter two studies is highlighted by the authors' decision to use symptomatic urinary-tract infections and positive cultures as endpoints rather than culture results alone as earlier trials had done. Finally, it is interesting to note that nearly 1 in 5 (18.9%) respondents believed that cranberry juice consumption could be used to treat urinary tract infections despite a complete absence of any literature supporting this therapy.

In conclusion, we believe our survey interestingly highlights the persistence of myths that surround this one alternative therapy even in a population that should be highly knowledgeable about urinary-tract health. As a medical advisor to a company that produces cranberry products, the author (J.A.G.) acknowledges an inherent bias toward a sympathetic interpretation of the literature supporting the beneficial effects of cranberry consumption. Yet, even if one is skeptical of the studies supporting cranberry consumption as a measure for preventing urinary-tract infections, it is important to be familiar with the literature in this arena as more and more patients look to complimentary and alternative medicines to treat their ailments. In light of the growing rates of antibiotic resistance among common urinary pathogens (Manges et al., 2001), we believe this potential area of prevention may become quite important (Howell and Foxman, 2002). While the results of this survey of ACOG Fellows will not dramatically revolutionize medical care it should remind us that as physicians, we too can maintain long-outdated misconceptions and we must constantly stay current with evolving sciences to educate and advise our patients properly.

Table 1. Respondents Answers to Questions

	Question 1: Prevention n = *419*		*Question 2: Treatment* n = *417*	
Answers	*Frequency*	*Percent*	*Frequency*	*Percent*
No	121	28.9	339	81.3
Yes	298	71.1	78	18.7
If yes, why?				
Acidification	187	62.8	47	60.3
Free radicals	10	3.4	5	6.4
Fructose	1	0.3	0	0
Proanthocyanidins	94	31.5	23	29.5

NOTE

Dr. Greenberg is a paid medical consultant for Ocean Spray, Inc., Lakeville, MA, a major producer of cranberry products.

REFERENCES

Avorn J, Monane M, Gurwitz JH, Glynn RJ, Choodnovskiy I, Lipsitz LA. Reduction of bacteriuria and pyuria after ingestion of cranberry juice. JAMA 1994;271:751–754.

Bodel PT, Cotran R, Kass EH. Cranberry juice and the antibacterial action of hippuric acid. J Lab Clin Med 1959;54:881–888.

Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, VanRompay M, Kessler RC. Trends in alternative medicine use in the United States, 1990–1997: Results of a follow-up national survey. JAMA 1998;280:1569–1575.

Howell AB, Foxman B. Cranberry juice and adhesion of antibiotic-resistant uropathogens. JAMA 2002;287:3082–3083.

Howell AB, Vorsa N, Marderosian AD, Foo LY. Inhibition of the adherence of p-fimbriated *Escherichia coli* to uroepithelial-cell surfaces by proanthocyanidin extracts from cranberries. N Engl J Med 1998;339:1085.

Kontiokari T, Sundquist K, Nuutinen M, Pokka T, Koskela M, Uhari M. Randomized trial of cranberry-lingonberry juice and Lactobacillus GG drink for the prevention of urinary tract infections in women. BMJ 2001;322:1571.

Manges AR, Johnson JR, Foxman B, O'Bryan TT, Fullerton KE, Riley LW. Widespread distribution of urinary tract infections caused by a multidrug-resistant *Escherichia coli* clonal group. N Engl J Med 2001;345:1007–1013.

Sobota AE. Inhibition of bacterial adherence by cranberry juice: Potential use of the treatment of urinary tract infections. J Urol 1984;131:1013–1016.

Stothers L. A randomized trial to evaluate effectiveness and cost effectiveness of naturopathic cranberry products as prophylaxis against urinary tract infection in women. Can J Urol 2002;9: 1558–1562.

James A. Greenberg, M.D.
Sara J. Newman, M.D., M.P.H.
Department of Obstetrics, Gynecology & Reproductive Biology
Brigham & Women's Hospital & Harvard Medical School
Boston, MA

Maria A. Morgan, Ph.D.
Research Department
American College of Obstetricians & Gynecologists
Washington, DC

Address reprint requests to:
James A. Greenberg, M.D.
1153 Centre Street, Suite 36
Boston, MA 02130

E-mail: jagreenberg@partners.org

CAN RELAXATION PROGRAMS WITH MUSIC ENHANCE HUMAN IMMUNE FUNCTION?

Dear Editor:

Changes in immune function have been observed in relation to psychologic stress (Kugler et al., 1996). A meta-analysis by Berger et al. (1997) suggests that stress management interventions have positive impact on the immune system. Such interventions mainly based on music- and aroma-based relaxation techniques but few studies focused on the combination of two or more techniques. The study presented here assessed the effects of relaxation program that combined physical and mental activation with the calming effect of meditation on immune function. Music was added to the relaxation program to evaluate the effect of music on immune response.

Subjects examined were 40 healthy female university students, 19–22 years of age (mean, 20.1), who consented to participate in the study after being informed of the content of relaxation program. Subjects were randomly divided into two groups that underwent the program with or without music (music and nonmusic groups, respectively; 20 subjects for each). The relaxation program was carried out in October 2001 (on 2 days) and was performed after lunch (1:00–2:30 PM) in both groups, following teaching about abdominal breathing (5 minutes) in preparation for meditation. The program was consisted of four steps: (1) alternately tensing and relaxing the arms and face repeatedly (5 minutes); (2) gentle exercise to stimulate the muscles of the entire body (5 minutes); (3) massage of the arms and head by another person (10 minutes); and (4) meditation in a reclining chair (20 minutes). Relaxing music with a slow tempo and no lyrics was used in step 1: *Healing Time (Fumio Miyashita),* step 3: *The Water is Wide* (Sissel featuring Zamfir, Trad., arranged by Akira Senju), and step 4: *Refresh Time* (Fumio Miyashita), and lively music that was easy to move to was selected for step 2: *Dreams* (The Cranberries). The music was played from stereo speakers (CA7 System Component, Panasonic, Tokyo, Japan). Secretory immunoglobulin A (S-IgA) and serum cortisol concentrations were measured using an enzyme-linked immunosorbent assay (ELISA) and high-performance liquid chromatography.

A two-way analysis of variance was performed with program (before versus after) and music (with versus without) as factors (Table 1). After completion of the relaxation program, there was a significant increase in S-IgA concentration but no significant change in cortisol concentration, indicating a transient immune response. This suggests that relaxation produces an immune response and is therefore effective for managing stress.

In contrast to the present study, Cruess et al. (2000) observed a decrease in cortisol levels in human immunodeficiency virus (HIV)-seropositive men after short-term, 45-minute relaxation exercises, suggesting that cortisol could be

Table 1. Effects of Relaxation Program on S-IgA and Cortisol Concentrations in Music and Nonmusic Groups (20 Female Students for Each)

		Music group		*Nonmusic group*		*Effects (F-values)*		
		Before	*After*	*Before*	*After*	*Program*	*Music*	*Interaction*
S-IgA (μg/mL)	Mean	77.34	170.18	79.3	151.79	106.69*	0.21	1.62
	SD	37.57	76.88	44.05	72.32			
Cortisol (ng/mL)	Mean	5.37	6.25	4.96	5.62	1.48	0.42	0.02
	SD	2.71	2.52	3.12	2.83			

Twenty (20) female students for each group.
[a]Two-way analysis of variance with program (before versus after) and music (with versus without) as factors.
*$p < 0.01$.
S-IgA, secretory immunoglobulin A; SD, standard deviation.

used as a neuroendocrine marker for short-term changes in mood. The discrepancy between the two studies might have been caused by the effects of physical stimulation used in our program or differences in age and health status of the subjects.

No relationship was demonstrated between the inclusion of music and change in concentration of S-IgA or cortisol after the program (Table 1), although evidence has been given that listening to preferred music is more effective for achieving a sense of calm (Charnetski and Brennan, 1988; Miluk-Kolasa et al., 1994). Personal tastes of the subjects should have been considered when selecting the music used in relaxation program. Also, elements in our program other than music might have had physiologic effects. Further research should be conducted on the usefulness of music in relaxation program.

ACKNOWLEDGMENTS

This study was conducted with Tokai Science Academy Grant (2002) and Grant-in-Aid of the Ministry of Education, Culture, Sports, Science and Technology (No. 14657638, 2002 and 2004).

REFERENCES

Berger JA, O'Brien WH. The effects of cognitive-behavioral stress management interventions on immune function: A meta-analytic review. Bowling Green, OH: Bowling Green State University, 1997.

Charnetski CJ, Brennan FX. Effect of music and auditory stimuli on secretory immunoglobulin A (IgA). Percept Motor skills 1998; 87:1163–1170.

Cruess DG, Antoni MH, Kumar M, Schneiderman N. Reductions in salivary cortisol are associated with mood improvement during relaxation training among HIV-seropositive men. J Behav Med 2000;23:107–122.

Kugler J, Reintjes F, Tewes V, Schedlowski M. Competition stress in soccer coaches increases salivary immnoglobulin A and salivary control cortisol concentrations. J Sports Med Physical Fitness 1996;36:117–120.

Miluk-Kolasa B, Obminski Z, Stupicki R, Golec L. Effects of music treatment on salivary cortisol in patients exposed to pre-surgical stress. Exp Clin Endocrinol 1994;102:118–120.

Kayoko Urakawa, R.N., M.A.
School of Nursing
Faculty of Medicine
Kazuhito Yokoyama, M.D., D.M.Sc.
Department of Public Health
School of Medicine
Mie Unviersity
Mie
Japan

Address reprint requests to:
Kayoko Urakawa, R.N., M.A.
2-174 Edobashi, Tsu
Mie 514-8607
Japan

E-mail: adiemus@nurse.medic.mie-u.ac.jp