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Christian Science
healing methods
explained

From the Harvard Symposium
"Spirituality and Healing in Medicine"

Reprinted from *The Christian Science Journal*, March 1999

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Divider Title: Self-Care

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Divider Title: Brisbane

BIOGRAPHICAL SUMMARY

FRANCES L. BRISBANE, PH.D.

Dr. Frances L. Brisbane is Professor and Dean of the School of Social Welfare, State University of New York at Stony Brook. She is Dean of the Black Alcoholism and Addictions Institute, co-sponsored by Morehouse School of Medicine in Atlanta, and the National Black Alcoholism and Addictions Council in Washington, D.C.

She is co-founder of "Counseling and Treating People of Colour: An International Perspective," a conference that draws people from Africa, Asia, Pacific Islands, Micronesia, Guam, American Samoa, South America, the Caribbean including Puerto Rico, the United States including Hawaii and Alaska, to discuss health, mental health, substance abuse, AIDS, violence, and education across cultural lines. This conference, now in its 15th year, draws professionals from approximately 30 fields and people from more than 37 distinct cultural groups. It is the only one of its kind in the U.S. and receives major support from the State University of New York at Stony Brook, the Kellogg Foundation, and the Bureau of Primary Health Care.

Dr. Brisbane created the 100% Drug Free Clubs, which operates in the United States, several African countries and the Caribbean as a model primary prevention program. She developed Project HOPE(ful) – a Spiritual Healing and Recovery Program. It is used nationally in treatment programs, churches, and at spiritual retreats. She has developed a model training program on "Overcoming Compassion Fatigue". It was designed for professionals in human services who deal with abandoned and neglected children, child-parent conflict, spousal abuse, substance abuse, terminally ill and dying patients and treatment services for women and men of color who are struggling with and surviving cancer. In addition, she developed a program in partnership with the SUNY School of Social Welfare that trains and certifies professionals in culture-based counseling.

She has written four books and edited three books on cultural competency- two for the Center for Substance Abuse Prevention (CSAP) and the other jointly sponsored by CSAP and the National Association of Social Workers. Her latest book *Dr. C. Browne: A Natural Health Doctor – The Man, His Medicine, and His Miracles* was published in June, 1999. Most of her written work is on substance abuse, cultural competency, ancestral and complementary medicine, Spirituality, children of alcoholics and working with African Americans.

Most recently (October, 2000) Dr. Brisbane received the University President's Award for Excellence in Diversity and Affirmative Action. In 1999, the New York State Office of Alcoholism and Substance Abuse Services, as one of eight New York women, featured Dr. Brisbane on a poster of "An Extraordinary Century for Women". Receiving this honor, which symbolized her 20th century contribution as being extraordinary in the substance abuse field, is one which she is most proud. (The other women were: Mother Clara Hale (1905-1992), Lois Wilson (1891-1988), Marty Mann (1905-1980), Dr. Jean Kirkpatrick, Dr. Sheila Blume, Dr. Marie Nyswander (1919-1986), Dr. Ann Streissguth).

Dr. Brisbane has lectured at many major conferences on ancestral health and healing practices among people of color.

She received her degrees from New York University, Columbia University, and Union Graduate School.

CAM and Wellness in Underserved and Minority Communities
-Integrative Approaches to Wellness: Self-Care-

Testimony to - *The White House Commission on Complementary
And Alternative Medicine*

March 27, 2001 Washington, D.C.

Frances L. Brisbane, Ph.D.

Most underserved minority populations and people of color, particularly those of African ancestry, are champions of self-care. They are also among the most secretive about the things they *do* and *take* when it does not conform to “majority” community or conventional health care standards of practice. They tend to be relatively open about their use of conventional therapies and chemical medicine prescribed by a physician.. Hence, observers are often led to believe conventional therapies and chemical medicine constitute their sole approach to gaining and maintaining wellness.

While the majority of underserved populations and people of African ancestry use integrative approaches to wellness, they do not access either health system initially. At the first sign of a developing health problem they are mentally exploring what is available in the home to stop progression of the illness. Neither a conventional doctor nor a CAM or ancestral health care practitioner is the first source to whom they turn. The medicine cabinet, kitchen cabinet, refrigerator, and other places in the home are likely to indicate the family’s initial self-care practices. Stored in these places is chemical medicine, including several years old unfinished prescription drugs, over-the-counter drugs, vitamins and herbs purchased after seeing them advertised on television, and food-medicines, such as cayenne pepper, garlic, prunes and vinegar.

Most underserved populations and specifically African ancestral people are quite clear when they should or should not use complementary and alternative medicine/ancestral medicine, and the appropriate time to use chemical medicine and conventional physicians. They are less certain, unfortunately, when and if it is advisable to share with their conventional physician their self-administered health care or the role a homeopath, herbalist or faith healer plays in their wellness program. To address this problem of “allopathic doctor sharing phobia,” there should be a policy that requires both CAM/ ancestral practitioners as well as conventional health clinicians to ask every patient about their use of conventional medicine and therapies *and* natural (including herbs, vitamins, foods) medicines and “alternative” therapies they are using. This, however, must be done in culturally sensitive ways or it will not achieve intended results.

It should be mandated that their answers are recorded. Additionally, it should be required that both conventional physicians and CAM practitioners read to every patient a statement which advises the patient of the fact that her or his health, ability to be cured, and life could depend on the patient’s revelation of accurate information.

It is extremely important that the CAM practitioner and the conventional physician follow some type of required format for receiving the type of information each needs to protect, in addition to treat patients. It rests with both sides of an integrative medical approach to learn as much as possible about the chemical medicine and the natural medicine that patients self-administer. Some underserved minority populations will not know that vitamins and herbs that they are taking are things which they should report to

conventional health care practitioners. They are likely to believe anything they can purchase “without a prescription” or as easily as they buy bread, milk, eggs, and fruit are not reportable items. Therefore, it is important to realize that not reporting natural products to conventional health practitioners is not necessarily an attempt to conceal this information. Because they use them in their self-care wellness program, they do not readily think of natural products when they talk to conventional health care providers. They equate these providers with someone who is basically interested in what chemical medicine they are taking for illnesses and diseases.

Many people of color believe in the power of *things* to ward-off illness and to maintain good health. In many ways part of their self-care and wellness program is their practice of wearing roots on their body, wearing a deceased mother’s ring, a copper bracelet, and the like. Some also carry stones, gems, and oils in their pocket or pocketbooks and will not venture away from home without these items. To them it is not superstitious. Instead, it is to keep arthritis pain away, to “cure” cancer, and other illnesses. This is their mind-body-spirit connection supported by their belief system.

At times, everyone provides medical care to her or himself. Many people today are accessing health care information from the Internet. Besides much of it not being accurate, some of it has not been tested and there is no certainty that it is good CAM/ancestral or conventional health information. But easily assessed health information, without cost (or modest cost), that can be self-administered is appealing to many underserved and minority populations. They usually pay no attention to the words “consult your physician before...” Some of them believe the directive is to have them

make an expensive doctor visit (when many do not have insurance) so the physician can dissuade them from doing what they feel is useful. And once they take over-the-counter chemical medicine or herbs and they do not experience any immediate harm, and actually feel better or as the advertisement promises, the chemical, vitamin, herb, magnet, energy medicine and the like become a “permanent” part of their self-care program.

Several years later when or if some underserved populations and people of color of modest means read the findings of conventional doctors and researchers that a product they are taking is dangerous to ones kidney or liver, they tend not to pay much, if any, attention to the warning. Based on the amount of time they have used a particular product-say two, four, or ten years-and it did not damage their liver or kidneys (or they do not know if it had) they continue to use it. They believe in their own “research of individual satisfaction.” It is this “research finding” to which the underserved minorities and most African ancestral people, especially those with limited financial means, accept as valid.

Where money is not an issue, many people of color who have a high level of education and a healthy respect for CAM/ancestral medicine usually have empowered themselves to ingest into their bodies whatever they desire. Basically, they are likely to have “watched” the excessive attention allopathic physicians, researchers and nay sayers have devoted to questioning the efficacy of self-care and discouraging the use of CAM health care providers (particularly if they are not conventional physicians). This group of people, like the general public of well educated individuals, tend to start or continue their use of CAM. They are not easily influenced by what they see as an

established system trying to keep a competing system from getting a stronghold in the marketplace.

Then, there are others among people of color and the underserved who are clearly not in this “well-informed, well-educated, and self-empowered” group. Therefore, in a climate of suspicion directed at the CAM “movement” and fear engendered about natural medicines prescribed by non-MD’s, this group finds it difficult to practice self-care, to become or to remain captain of their own wellness plan. They are just “ordinary citizens,” many under forty who have found it easy to buy-into the “medical wisdom” that conventional physicians are the authority, many of them do not embrace or support self-care, and they have medical training, and medical degrees which most self-healers and CAM practitioners do not have. Some people among this group are even frightened by the “consult your physician” warning which keeps them from venturing into self-care. They theorize that if they need to consult their physician *anyway*, they might as well go to her or him in the first place, provided they can afford the visit. Hence, some of them refuse to take anything more than an aspirin without consulting a doctor. This places a tremendous *burden of worry and burden of finance* on many underserved populations and people of color. While I think this group is in the minority among people of color and underserved populations, they do exist. To administer to their needs, I believe there should be more sensitivity to the public in general by having a medium to communicate to people when a product or therapy actually needs the advice of a physician or licensed health care practitioner. Certainly, many of the natural products that carry the “need to consult a physician” label should be examined and the directive

kept, if it is warranted. By the same token, it should be removed if not necessary.

Another approach could be a full explication of what people “need to know” so they may determine if they should consult a physician. This, however, is not a substitute for placing directives to consult a physician or other licensed health care practitioner when it is clearly indicated as a necessity. And in most cases, the directive should simply be – “consult a licensed health care professional.” In many instances, if not most, people are being directed to a physician who is not likely to know anything about a natural product or its potential danger if taken alone or with other medicines. CAM or natural health/ancestral health practitioner may be much better qualified to assist the person.

An additional group among the underserved and people of color firmly believe, as Diane Goldner (1999, Hampton Roads Pub. Co.), author of *Infinite Grace*, reported from medical research, that a relationship exists between religion, spirituality and science.” In this underserved minority population and particularly people of African ancestry, their number one self-care is prayer and church attendance. In fact, they consider prayer their number one herb and church attendance and involvement in religious rituals as their most effective self-care. Most of these same people adhere to conventional medicine *and* CAM/ancestral medicine and therapies. They may also think of the God of their understanding as the spirit or spirit force that guides the decisions they make. Sometimes they realize the science that guides conventional medicine renders conventional medicine to be what they need at a particular time. In the meantime, many are firm believers in and users of roots and leaves and other things from “God’s earth.” Now called herbs, these products are used as standard self-care. The same people who use herbs are quite likely to include vitamins and homeopathy in

their wellness program. Among African ancestral people many continue to cook dark green leaves (collards, mustards, turnip greens) and add dandelion leaves in the pot. They eat the greens and drink the water in which they are cooked. This water is called “pot liquor” and they believe it cures and prevents many ailments, including liver problems.

Does it work because they believe it based on centuries of hearing their ancestors tell them it works? Or is it all in their minds? Again, they believe more in their own “research of individual satisfaction” than in what any scientific studies may prove to the contrary.

Specifically, the worldview of people of African ancestry is that of having as their highest value respect for the interpersonal relationship. The natural healer or conventional doctor who inspires confidence and faith in her or his ability *is part of the medicine*. Therefore, if they have a quality relationship with both a conventional doctor and a CAM/ancestral healer, they care about what both think about what they are doing and taking. But the relationship must show respect for them being self-directed and empowered to make their decisions, particularly when a safety issue does not exist. If disrespect from either side of the integrative health team tramples on the interpersonal relationship, the relationship will be terminated by people of African ancestry. It’s also terminated if the ancestral health practitioner is the one who damages the relationship. Because they are accustomed to this type of health practitioner being friendly, accessible, and whole-person oriented who nurtures the relationship with overtures of kindness. Therefore, they terminate the relationship immediately.

Because most people of African ancestry are “shocked” and greatly pleased when a conventional doctor has, in their perception, “ancestral health practitioner behavior,” they are likely to tolerate her or him for a while after the interpersonal relationship has become toxic. Hence, they continue to see the doctor based on the history of their previous good relationship but they do not follow her or his advice. Instead, they continue to seek the services of an ancestral health practitioner, with whom they have a good relationship, for guidance in their wellness program. Then, gradually they “wean” themselves away from the conventional health practitioner. They may claim a cure has taken place or they are moving “out of state” or any combination of excuses. This way of handling an interpersonal relationship that has become toxic is indicative of the great value African ancestral people attach to an interpersonal relationship. It also demonstrates that it is difficult for many underserved minority populations, African ancestral people and people of color to confront a conventional doctor.

Another point I wish to make on behalf of the underserved and people of color communities is that the widely publicized causes of disease and death by federal, state, and local health agencies do nothing for their *mental* wellness. Because many underserved and people of color communities are without the financial resources to prevent an illness or death that may require accessing the expensive conventional medical system or purchasing prescription drugs. Therefore, these health agencies, I believe, should assume a legal and moral responsibility to help various populations to “do self-care” by systematically making available every bit of life saving advice, including natural and conventional approaches. This should be done concurrently with the release

of any health or disease “statistic of fatality.” It should be given in a creative format that appeals to different underserved minority cultures in order that they will *read* or *hear* the message. To highlight the importance of this, an example of a format is for the Surgeon General (or community leader) to regularly announce life-saving prevention procedures in a scheduled “National Health Chat with African Americans,” “National Health Chat with Hispanic/Latinos,” “A Health Chat with (other specific group).” The medium for delivering these messages could be the television, web page or any combination of technology that goes directly into homes, schools, churches and other places identified by a specific cultural group as being relevant to them. (Previously, Surgeon Generals have given health messages about smoking, preventing birth defects and childhood obesity that have been enormously helpful).

What I am trying to express through the information above and the policy and practice recommendations I have suggested, is: A first course for achieving and maintaining self-care and wellness among many underserved minority populations and specifically African ancestral groups, is to make it easy for them to secure the health information they need. Because the way many African ancestral people define wellness is absent of pain, lack of impairment in individual and social functioning, causes me to believe that the wheel driving their self-care is propelled by convenience and conviction that whatever they do is necessary and will yield the results they expect.

It is well known that prevention is not something that most Americans in general invest a lot of time in. It is the same with underserved minority populations. However, with them, unless they believe the consequences of illness will cause them irreparable

harm through great pain, maiming, and impairment of function in many areas of their life, they perhaps, won't subscribe to costly prevention. They certainly will not if it causes too many problems in their life in general. Most of these groups subscribe to the belief that the "treatment should not be more painful than their problem". Furthermore, if using preventive measures are costly and they believe ancestral remedies will serve the same purpose, they are more likely to use them, regardless of not knowing their safety status. When this "try before tested" type of self-care proves unsafe, people are driven to conventional care as a corrective measure. They then use the "back door" to an integrative health care approach.

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Divider Title: Moxley

Cathy Moxley, M.A.

Cathy Moxley, M.A.

Cathy Moxley, M.A., is manager of Health and Wellness for Marriott International, Inc. In this capacity, Cathy is responsible for the strategic development, implementation, and evaluation of Marriott's *Wellness & You!* health promotion program for approximately 4,000 Marriott corporate headquarters associates. In addition, she is the designated resource for Marriott field operations in the development of field-based wellness initiatives as needed.

Cathy has been involved with Marriott's *Wellness & You!* program since its early development stages and official introduction in 1993. As manager of the *Wellness & You!* program, Cathy provides a comprehensive schedule of programs on such topics as blood pressure, cholesterol, nutrition, smoking cessation, and stress management. In 1995, the *Wellness & You!* program received the C. Everett Koop National Health Award for its success in significantly reducing employee health care costs by improving health through wellness programs and education.

Cathy frequently speaks to lay audiences on the topics of stress and weight management, and to professional audiences on strategic and program planning at health promotion industry conferences. In addition, through Marriott's Executive Development Program, Cathy provides individual wellness consultations for Marriott executives.

Cathy currently serves as the president of the mid-atlantic regional chapter of the Association for Worksite Health Promotion, providing strategic leadership in this professional membership organization.

Prior to the introduction of the *Wellness & You!* Health Promotion program at Marriott in 1993, Cathy was the Program Coordinator for the Marriott Corporate Fitness Facility. She has a Master's degree in Exercise Physiology and a Bachelor of Science in Kinesiology, both from the University of Maryland, College Park.

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Report to the White House Commission on Complementary and Alternative Medicine Policy

Corporate Wellness With Special Emphasis on Aspects Related to CAM

Cathy Moxley, M.A.

Manager, Health and Wellness, Marriott International, Inc.

March 27, 2001

Introduction

Today, over 80% of America's businesses with 50 or more employees have some form of health promotion program. As the members of this commission are well aware, more than 50% of all deaths in the U.S. are caused by lifestyle related problems, including smoking, sedentary lifestyle, poor nutrition, and obesity. Because of the large percentage of time most Americans spend at the workplace, what better place to target health promotion efforts and information dissemination. In addition to benefit to the individual, corporate America also has much to gain from investing in employee health:

Healthcare Cost Economics

- illness avoidance
- health consumerism
- chronic disease management

Productivity

- absenteeism
- injury/disability
- turnover
- morale

Image

- corporate/community citizen, loyalty
- recruitment, competitive advantage

Marriott International's Wellness Program

1993

In addition to the reasons listed above, health promotion is consistent with Marriott's long-standing philosophy of "take care of the associate and they'll take care of the customer" and Marriott's Human Resources efforts to be a preferred employer.

Four Departments Serve the Health and Wellness Needs of Marriott HQ Associates

- The *Wellness & You!* Program –comprehensive wellness programs
- A Full Service Fitness Facility including Group Exercise Classes, Fitness Testing, Personal Training, Sports Leagues, etc.
- Employee Assistance Program – LCSW for mental health and other counseling issues
- Associate Health Services - Nurses for injuries and illness management

Marriott's Past and Present Wellness Initiatives

- Health Risk Appraisals
- Follow-Up Counseling for High Risk Associates
- Health Screenings (i.e. blood pressure, cholesterol, bone density, skin cancer)
- Monthly Wellness Newsletter
- Monthly Wellness Theme with corresponding programs
- Lunch-time Seminars
- Smoking Cessation Programs
- Nutrition Counseling
- Weight Management Programs
- Stress Management Programs
- Back Care Programs
- Lactation Program
- Health Fairs
- Wellness Resource Center
- Walking Club
- Incentive Programs
- Ergonomic Programs
- Flu Shots
- Self-Care and Travel Health Information
- Wellness Advisory Council of Senior Management
- Volunteer "Wellness Action Team" committee

Marriott's Past and Present Wellness Programs Related to CAM

- Seated Massage Program
- Yoga classes
- Tai Chi Classes
- Lunchtime Seminars on various CAM topics
- Exhibits at Annual Health Fair on CAM topics, such as Chiropractics, the Acupuncture Institute, Magnet Therapy, Biofeedback
- Newsletter Articles on CAM topics

Most Common CAM Vendors

- Chiropractors
- Nutritional Products

Corporate Wellness Emerging or Continuing Prominent Issues

- Obesity
- Diabetes
- Mental Health
- Heart Disease
- Escalation of the Health Care Costs, especially Pharmaceuticals
- The inclusion of health promotion into the medical and business mainstream, such as making health promotion procedures reimbursable.
- Increasing allocations for health promotion research to better reflect the huge burden of lifestyle on disease and death in the United States.

Corporate Wellness Obstacles

- While there is much research supporting the health and financial impact of health promotion, in difficult economic times, wellness programs may be among the first to be cut when difficult budget decisions must be made.
- Senior management support is crucial. Corporate politics can be a factor in the growth or and/or decline of wellness programs.
- Many of the benefits of corporate wellness programs are long-term, while an individual's employment with a particular company may be short-term.

Opportunities Specific to CAM

- Increased methods for standardizing, regulating or credentialing providers of CAM to improve confidence in vendor and program selection.

Obstacles Specific to CAM

- The general public's interest and hunger for information related to CAM topics obviously extends to our sub-population. And, a multitude of programs, vendors, and providers target corporations, extending along a large continuum of credibility. The corporate wellness professional may sometimes have difficulty making decisions regarding the credibility of a CAM topic or particular provider, given the constantly changing status of research. And because providing information or programs through the workplace can be construed as the "Company" endorsing a concept, whether explicitly or implicitly, this responsibility makes it delicate work to navigate through the credibility and appropriateness issues of what can or should be offered through the workplace. Ultimately, we strive to strike a balance between offering well-developed programs on well-accepted modalities and concepts and periodic exposure and education on less-proven topics.
- Another obstacle is finding the "right" providers – ones that are credible, affordable, available on the days/times we need, geographically near-by, and able to fit into the corporate environment.

Resources

- The American Journal of Health Promotion (<http://www.healthpromotionjournal.com>)
- The Association for Worksite Health Promotion (<http://www.awhp.org>)
- The Wellness Councils of America (<http://www.welcoa.org>)
- The National Wellness Association (<http://nationalwellness.org>)

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Prestwood

Divider Title: _____

Karen Prestwood

Dr. Prestwood has been in academic medicine for over 10 years, including a fellowship in Geriatrics. Dr. Prestwood is well known in the field of geriatrics and aging research. She successfully competed for and completed several major career development awards in aging including the American Federation for Aging Research, The Brookdale Foundation and the Paul Beeson Physician Faculty Scholar in Aging Research Awards. She was awarded a prestigious National Osteoporosis Foundation grant and received several investigator-initiated grants from pharmaceutical companies.

Dr. Prestwood has a major role in the Claude Pepper Older Americans Independence Center at the University of Connecticut Health Center where she is principal investigator on one of the major intervention development studies of the center and the core leader of the Recruitment, Retention and Data Management Core. She was Associate Director of the Pepper Center from its inception in 1996 until October 1999, when she started sabbatical leave. Dr. Prestwood is the Associate Director for Research and the Assistant Program Director of the Geriatrics Fellowship Program. In addition, she has been the Director of the Research Curriculum for the Geriatrics Fellowship at UCHC since 1995. Dr. Prestwood is a senior mentor in both the Claude Pepper Older Americans Independence Center and Center for Interdisciplinary Research in Women's Health and is a member of the Scientific Advisory Committee of the General Clinical Research Center and the Selective Committee for Fourth year medical students (provides research training experiences for students). Dr. Prestwood mentors geriatric and endocrinology fellows, medical students and MPH-students in research.

Dr. Prestwood maintains a clinical practice where she sees primarily older adults with osteoporosis or other endocrine diseases. She developed an interest in CAM approximately 5 years ago and began to explore its use both from a personal and professional standpoint. In October 1999, Dr. Prestwood began a 1-year sabbatical leave. The purpose of the leave was to study complementary and alternative medicine with the goal to return to UCHC and develop a program in integrative medicine that includes clinical care, research and teaching. During the year, Dr. Prestwood immersed herself in study and attended major conferences in Integrative Medicine, Spirituality in Medicine, Alternative Medicine, and Botanicals in Clinical Medicine sponsored by Columbia University. She participated in several workshops on practical aspects of initiating an integrative medicine (one which integrates CAM with allopathic medicine) clinic. Dr. Prestwood took an introductory course in Chinese medicine and began training in Healing Touch through the American Holistic Nurses Association and Healing Touch International, Inc. During the year, Dr. Prestwood connected with various local CAM practitioners to better understand different approaches to diagnosis and treatment of disease as well as maintenance of health in older adults. Dr. Prestwood is a member of the American Holistic Medical Association and is on the AHMA research committee. She actively participates in the Connecticut Holistic Health Association where she can interact with CAM providers who are interested in collaboration in research as well as clinical care.

Since returning from sabbatical, Dr. Prestwood received training in Consciousness and Imagery in Healing (Achterberg, Rossman, Simeton) and she completed Mind-Body-Spirit Training for Professionals, lead by Dr. James Gordon. Dr. Prestwood continues her training in various forms of energy medicine. Her clinical practice is now an integrative practice and includes primarily older adults. She plans to further expand the practice so that she will work as part of a team with various CAM practitioners on site at the Health Center. Dr. Prestwood also developed research initiatives to evaluate various CAM modalities in maintaining and improving functional status in older women with osteoporosis- several of these initiatives are funded and will begin shortly.

KAREN M. PRESTWOOD, MD
UNIVERSITY OF CONNECTICUT HEALTH CENTER
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EDUCATION:

1978 BS, Biology, Dickinson College, Carlisle, PA
1980 MS, Radiation Health, University of Pittsburgh, School of Public Health, Pittsburgh, PA
1985 MD, Hahnemann University, Philadelphia, PA

EMPLOYMENT:

6/85-7/88 Residency (Full Time), Dept. of Internal Medicine, Hahnemann University Hospital, Philadelphia, PA
7/89-6/91 Fellow in Geriatrics (Full Time), University of Connecticut Health Center, Farmington, CT
7/91-8/93 Instructor of Medicine (Geriatrics), Center on Aging, University of Connecticut Health Center, Farmington, CT
9/93- Assistant Professor of Medicine, Center on Aging, University of Connecticut Health Center, Farmington, CT
7/96- Assistant Program Director, Geriatrics Fellowship, University of Connecticut Health Center, Farmington, CT
9/96- Associate Director, Claude Pepper Older Americans Independence Center, UConn Health Center, Farmington, CT

HONORS:

1991-92 John A. Hartford Foundation Scholar
1992-93 American Federation of Aging Research Grantee
1993-96 Brookdale National Fellow
1994-96 National Osteoporosis Foundation Grantee
1996-99 Paul Beeson Physician Faculty Scholar in Aging Research

LICENSURE AND CERTIFICATION:

1988 Connecticut License
1992 American Board of Internal Medicine, Added Qualifications in Geriatric Medicine

SELECTED PAPERS:

Kenny AM, **Prestwood KM**. Osteoporosis: Pathogenesis, diagnosis and treatment in older adults. In: *Rheumatic Disease Clinics of North America*. Richard F. Loeser, Jr. & Kenneth O'Rourke, eds. Philadelphia: W.B. Saunders Co. 2001 (in press).

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CAM, WELLNESS, AND SELF-CARE AND THE ELDERLY

An 85 year old has been healthy all of his life - a great outdoorsman who loves fishing, gardening and walking in the woods. He has always been active in a local church and is surrounded by a loving wife, 2 children, and many grand and great grandchildren. He developed angina when he walked the hills in his neighborhood and, on further evaluation, it was determined that he had significant coronary artery disease and he underwent bypass surgery. He fully recovered from the surgery and went back to his usual activities, albeit on several new medications. Several years later, he developed a case of shingles, or herpes zoster, for which he was treated. However, he developed chronic herpetic neuralgia and was disabled by the pain. Over the next 6 years, due to severe pain, he declined to the point where he was only out of bed for several hours per day, he gave up gardening, and it was even painful for him to be embraced by his family. In spite of the pain, he continued to walk daily until one of his pain medications made him so clumsy that he fell and broke his nose. After that incident, he was afraid to walk. He tried other medications and even a nerve block for the pain but none of these interventions helped his pain and all caused side effects. His physicians told him that they had no other options for him - that he would have to live with pain. This man is my grandfather, and as I began to explore the possibility of CAM with him I found that not only was it difficult to find practitioners who were accessible to him (he no longer drives), but he was unable to afford the fee for a treatment course.

I'm sure you have heard stories like this many times today and at other times in your work. My grandfather's story helps illustrate some of the points I would like to make related to the use of CAM to promote wellness and self-care in older adults.

By the year 2020, 20% of the world population will be over 65 years. In the U.S., 8% of the population is currently over 65 years and in 2020, it is estimated that 25% will be over 65 years (roughly 65 million older adults).

There is a wide variety in apparent rates of aging among different persons. This individual variation in physiologic efficiency increases with advancing age. Thus, the older adult population is quite heterogeneous with a large proportion that has aged successfully and continues to have few or no chronic conditions while others have multiple diseases and excess disability. In a population study, approximately, 14% of men and 24% of women between the ages of 65-74 years reported some disability. In the age group over 75 years, 23% of men and 41% of women report disability. In older adults, functional status is the most important marker for wellness. When we see patients for an initial evaluation or in follow-up we use standardized measures to determine physical, emotional and cognitive function. These functional measures help us to really understand how patients are doing - even if they do not have any increases in disease-specific symptoms. Frequently, these measures are the first indication that a particular disease process or the burden of multiple diseases is worsening. Likewise, improved functional status is an early indicator that the patient's overall health is improving. In older adults, wellness is related to maintaining or improving function rather than the prevention of specific diseases. We know that even those adults with high levels of disability can and do experience long-term improvements in functional status when some targeted intervention is provided. This implies that we need to provide access to CAM to older adults across a spectrum of function and across a number of living situations (community, assisted living, nursing homes).

Encouraging self care and wellness in older adults involves 2 important tasks: education of those who already believe that they can participate in their own care and want to be involved and empowerment of those who are skeptical about self care and want the doctor to provide a silver bullet that will make them 'well'. While these issues are not unique to older adults, the current cohort of 85 year olds may require more empowerment (followed by education) than baby boomers when they are 85 years old. In addition, one must consider the different needs, related to CAM, of those who are aging in what we consider a 'usual' manner compared to those who are aging 'successfully'. With usual aging the goal is to maintain or

improve function and quality of life. With successful aging we would add disease and disability prevention.

One of the major concerns in older adults is polypharmacy, the use of multiple medications. Older adults constitute about 12% of the population but consume approximately 25% of prescription medications each year. It has been estimated that older North Americans take an average of 4.5 medications at any one time. Most of these patients are taking prescription and over-the-counter (including more nutraceuticals) medications. Further, several studies demonstrated that the number of adverse drug effects increases dramatically with the number of medications (from 15% with 2 medications to 50-60% with 5 medications). CAM may well reduce the number of medications older adults take, particularly since the major classes of medications used by older adults treat diseases that have been shown to benefit from one or several CAM modalities (cardiovascular, antihypertensives, analgesics, arthritis, psychotherapeutics), at least in younger patients. In geriatrics we use a framework for adjustments of drug therapies, considering concomitant diseases and a knowledge of drugs that are likely to be co-administered in older patients, along with guidelines for adjustments in dosing or drug combinations to optimize beneficial effects and avoid adverse effects. CAM could be integrated into this framework and result in improved care for older adults.

On the other hand, older adults are typically more sensitive to medications and frequently require reduction of dosage to minimize adverse effects. It is possible that the same is true for CAM, particularly herbal remedies and vitamins, but also for other modalities, such as energy medicine. As we begin to integrate different systems of care, it is important to be aware that changes in the body that occur with aging predispose older adults to adverse events and that 'starting low and going slow' should be the *modus operandi* until studies more clearly document safety in older adults specifically.

Reimbursement of services and access to care are challenges that particularly affect older adults. Even in an affluent state such as Connecticut, many older adults live on fixed incomes and are unable

or unwilling to pay out of pocket for CAM - even if these modalities could potentially save the health system money. Further, practitioners may accept other forms of insurance but are reluctant to consider Medicare (even if the treatment is covered) because of the more rigorous criteria for reimbursement and the administrative time and costs. As we begin to think about long-term solutions for reimbursement for CAM, we must find solutions that include Medicare so that a group of patients who could potentially benefit greatly from this type of care are not excluded from it.

Access to care is also an issue for older adults who are not able to drive or who rely on family members or public transportation. Centralized facilities, in which multiple care providers practice, would enhance access to care for older adults. In addition, these centralized services would increase the opportunity for various practitioners to collaborate on the care of individual patients.

In geriatrics, the multidisciplinary team is basic to our way of practicing medicine. Geriatricians already work with and value the input of health care providers who are not trained as medical doctors, such as nurses, physical and occupational therapists, nutritionists and social workers. Integration of CAM providers into a geriatrics care team would enhance the work of the team and provide more holistic and, perhaps, cost-effective care for older adults.

Recommendations:

1) Education

In order to increase CAM knowledge of patient and allopathic medical personnel, we need to have educational plans for older laypersons and training for physicians at all levels. Broad dissemination of research results is necessary and this is already happening through the NCCAM web site and newsletter. Increase training of physicians who care for older adults on the use of CAM through formal on-site and distance learning models. Emphasize differences in care of older adults related to CAM medicine. Teach health care

professionals about self-care and the importance of leading by example.

2) Research

It is important to make sure that adequate numbers of older adults are included in planned intervention trials. Collaboration with NIA on research in a variety of areas (in addition to areas already being explored) is vital. Research on CAM modalities in older adults must include adequate measures of functional status, quality of life and evaluation of adverse effects. Cost-benefit analysis is an essential part of research protocols so that we can better understand how/if reimbursement through Medicare should be modified.

3) Clinical care

Models in which allopathic and CAM providers are centrally located will likely make care more accessible for older adults. The multidisciplinary team approach is already a standard approach in geriatrics and integration of CAM into existing teams (and reimbursement to support team) would be relatively simple to implement. Reimburse CAM for older adults (and sponsor more research to support its use).

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Puchalski

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Dr. Puchalski is Assistant Professor, Department of Medicine at George Washington University School of Medicine, Washington, D.C. and Director of Education at the National Institute for Healthcare Research (NIHR), Rockville, M.D. She is also founder and director of the newly-established Institute for Spirituality and Health at George Washington University.

Dr. Puchalski has developed numerous educational programs for undergraduate, graduate, and postgraduate medical education in spirituality and medicine. Her research interests and expertise include the role of spirituality in healthcare and end of life, the role of clergy in health and in end-of-life care, and evaluation of education programs in spirituality and medicine. Dr. Puchalski is co-chair of a national education conference co-sponsored by the Association of American Medical Colleges (AAMC), Associate Course Director of Harvard Medical School and the Mind/Body Medical Institute's annual Spirituality & Healing in Medicine conference, and co-convener of the spirituality task force for the Last Acts Campaign. Her work has been featured on *Good Morning America*, *ABC World News Tonight*, *NBC Nightly News* and in major newspapers across the country. She is the recipient of the AAMC and Pfizer's 1999 Award for the Medical Humanities Initiative. Dr. Puchalski's work in the field of spirituality and medicine encompasses the clinical, the academic, and the pastoral application of her research and insights.

Wellness and End of Life Care

White House Commission on Complementary And Alternative Medicine Policy

**Meetings on Complementary and Alternative Medicine in Self-Care and Wellness
and Information Development and Dissemination
March 26-27, 2001**

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Spirituality is an essential aspect of end of life care and one that deserves prominence in our healthcare system. Spirituality can be defined as that which gives a deep meaning and purpose in a person's life and often how people cope with suffering. Spirituality can have many expressions: in religion, art, family, other spiritual beliefs.¹ National surveys show that people value the spiritual dimension in dying. Also, other data shows that people utilize their spiritual beliefs to help them cope with chronic illness and with dying. We who work with patients know the importance of spirituality for those that are seriously ill. I propose three initiatives that would help patients at the end of life.

The first initiative is: Spiritual care should be made available in all settings in which the terminally ill are treated.

The second initiative is: Healthcare professionals and faith communities need to be trained in recognizing the importance of spiritual care particularly at the end of life.

The third initiative is: Spiritual care should be reimbursed by medicare and other third party insurance.

1. Spiritual care should be made available in all settings in which the terminally ill are treated.

A recent survey by George Gallup polled Americans about what their needs would be if they were dying.² The two major needs demonstrated in this survey were that people want:

- Companionship – people do not want to die alone and they want warm, caring relationships with their physicians; and
- Spiritual comfort – such as receiving blessings from their clergy, living on through their relationships and their accomplishments.

The conclusions from the Gallup survey and other surveys is that it is as important for healthcare providers and other caretakers to talk with patients about these issues as it is to address the medical-practical side of care.^{3,4}

There is also data that suggests that spirituality may be helpful to people as they cope with dying. For example, patients with advanced cancer who also found comfort from their spiritual beliefs were more satisfied with their lives, were happier and also had diminished pain.^{5,6} In a national survey by the American pain society, prayer is the most common non-drug method for dealing with pain.⁷ Patients with cancer and AIDS felt that their spiritual beliefs helped them cope with their illness and with facing death.⁸ There is also data on the role of the beneficial effects of meditation termed the relaxation response by Dr. Herbert Benson, as an adjunct to treatment of patients with serious illness.⁹ Spirituality offers people hope in the face of the despair that can occur in the course of serious illness and dying. Initially the hope may be for a cure; when cure is no longer possible, the person may hope for time to finish old projects, making peace with loved ones, with God, and have a peaceful death.

It is critical that our systems of care allow people to have the opportunities to explore their spiritual issues. Spiritual care means:

- All care providers should address the spiritual issues of patients and be trained to respond

to those issues;

- Chaplains (CPE trained) and other spiritual care providers should be recognized as experts and as members of the interdisciplinary healthcare teams in all settings: outpatient clinics, hospitals hospices, nursing homes, etc.;
- Patients' hopes, dreams, fears and anxieties should be respected and listened to just as much as their symptoms; and
- Opportunities should be made available for reflection, prayer, and meditation (specifically, the teaching of the relaxation response to patients).

2. Healthcare professionals and faith communities need to be trained in recognizing the importance of spiritual care particularly at the end of life .

Right now, through a program I direct, there are courses in over 70 medical schools, and several residency programs on spirituality and health.^{10,11,12} The response to these courses has been overwhelmingly positive. Physicians want to be responsive to the holistic needs of their patients. Physicians, nurses and clergy want training in spirituality and end of life care. Faith communities are available and willing to minister to those patients who are ill and dying but often feel unprepared. Training programs are essential for all these professional caregivers. These programs should address:

- The role of spirituality in health and in end of life;
- How to address patients' spiritual needs;
- How to recognize spiritual suffering;
- How an interdisciplinary approach to care can build communities of caring (i.e. doctor, nurse, chaplain, social worker, family, faith community all caring for patient together); and
- For clergy and faith communities – how to recognize end of life symptoms, spiritual suffering and how to work within the health care systems.

3. Spiritual care should be reimbursed by medicare and other third party insurance.

The data as well as anecdotal experiences from physicians and other care providers demonstrate

that spirituality is very important particularly in chronic illness and in end of life care. However, our healthcare systems are driven by reimbursement. Physicians while wanting to take the time to do spiritual counseling are often prevented due to time pressures and reimbursement restrictions. Chaplains in out patient settings need to be reimbursed for their time. There is one program in Colorado called Sloans Lake that reimburses chaplain visits in the outpatient setting. The relaxation response is a clearly defined technique which can benefit patients and which could be reimbursable. Therefore, important aspects of care such as spirituality need to be supported and must be reimbursed because they are vital to the needs of patients.

In summary, spirituality is important in well being at the end of life. My recommendations are for the following initiatives:

1. Spiritual care should be made available in all settings in which the terminally ill are treated. ✓
2. Healthcare professionals and faith communities need to be trained and supported in recognizing the importance of spiritual care particularly at the end of life . ✓
3. Spiritual care should be reimbursed by medicare and other third party insurance. ✓

These three initiatives will help the terminally ill patient and their families at a time of crisis in their lives. Dying is one of the most difficult things any of us will face. We need to create systems of care that will recognize not only the physical dimensions of care but also the spiritual. By recognizing this important dimension we will transform our healthcare systems from a cold impersonal system to one that is a caring community where all patients' and families' needs could be met.

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Spirituality and End of Life Care: A Time for Listening and Caring

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Dying is a normal part of life. In today's society, however, dying is still treated as an illness. All too often people die in hospitals or nursing homes, alone, and burdened with unnecessary treatment; treatment, they would have refused if they had the chance to talk about their choices with their physicians long before the deathbed scene. Dying people are not listened to...their wishes, their dreams, their fears go unheeded. They want to share those with us.

At the turn of the century, American's life expectancy was 50 years. Now 73% of deaths are among people at least 65 years old and 24% of deaths are among those at least 85 years old according to an end-of-life committee of the Institute of Medicine. The causes of deaths in 1990 were influenza, tuberculosis, diphtheria, heart disease, cancer and stroke. Today heart disease is the number one cause of death followed by cancer and stroke. Modern medicine has granted more people an old age but it also slows the process of dying. The end of life can last several years.

As baby boomers and their parents' age, problems in end of life care are increasingly well documented from under-treated pain to unwanted or futile therapies. The Institute of Medicine committee reported on a study that showed that 40% of family members of people who died reported their loved ones being in severe pain. 10-50% of various patient populations receive care that violates their preferences, often in the form of costly ER visits or ICU stays.

People often die alone and in pain in hospitals or ICU's. However, when surveyed 90% of people said they would prefer to be cared for at home if they were terminally ill with 6 months or less to live. In the early 1900's people did die at home. But in 1992, 57% deaths were in hospitals, 37% deaths in nursing homes and other residencies. Hospices provide excellent care but hospice referrals are not the perfect solution. To receive Medicare benefits a patient must be expected to die within six months and the patient must forego curative therapies. Patients and insurance companies want physicians to make prognosis about time of death. Patients often want us to tell them when they will die and we often want that certainty too before we give up on therapies. Yet, numerous studies have shown that such estimates are often wrong.

So how can we meet our patient's needs, where they can die at home and can avoid having treatments that violates their preferences? How can we, as healthcare providers and as a society guarantee people a peaceful, meaningful death? There are no easy answers, but there are numerous efforts, studies and groups in this country working hard to improve the care of the dying. One way to help dying patients is to really listen to them. This is where spirituality becomes so important in the care of the dying.

Dying should be as natural an experience as birth. It should be a meaningful experience for dying persons, a time when they find meaning in their suffering and have all the dimensions of their experience addressed by their caregiver. These dimensions are:

- the physical (pain and symptom control)
- the psychological (anxiety and depression)
- the social (feeling cut off from friends and family, feeling too fatigued to engage in social activities)
- the spiritual

It is our responsibility to listen to people as they struggle with their dying. We *need* to be willing to listen to their anxieties, their fears, their unresolved conflicts, their hopes, and their despairs. If people are stuck in despair, they will suffer deeply. It is through their spirituality that people become unstuck from despair. Victor Frankl wrote that man is not destroyed by suffering; he is destroyed by suffering without meaning. Spirituality helps give meaning to people's suffering. It helps people find hope in the midst of despair. We, as care givers, need to engage with our patients on that spiritual level.

That spirituality is central to the dying person is well-recognized by many experts, the most important of which are our patients. A recent survey by George Gallup showed that people overwhelmingly want to reclaim and reassert the spiritual dimensions in dying. In the study, survey respondents said they wanted warm relationships with their providers, to be listened to, to have someone to share their fears and concerns with, to have someone with them when they are dying, to be able to pray and have others pray for them, and to have a chance to say goodbye to loved ones. When asked what would worry them they said not being forgiven by God or others or having continued emotional and spiritual suffering. When asked about what would bring them comfort, they said they wanted to believe that death is a normal part of the life cycle and that they would live on, either through their relationships, their accomplishments or their good works. They also wanted to believe that they had done their best in their life and that they will be in the presence of a loving God or Higher Power. It is as important for healthcare providers and other caretakers to talk with patients about these issues as it is to address the medical-practical side of care. Patients certainly want their physicians to talk with them about their spiritual needs as numerous surveys have shown. In these surveys, 65-70% of people polled say they want their physicians to address their spiritual issues with them yet only about 10% of their physicians actually do.

There is also data that suggests that spirituality may be helpful to people as they cope with dying or with loss. For example, patients with advanced cancer who also found comfort from their religious and spiritual beliefs were more satisfied with their lives, were happier and also had diminished pain. Women with breast cancer felt that their spiritual beliefs helped them cope with their illness and with facing death.

How does spirituality work to help people cope with their dying. One mechanism might be through hope. Spirituality and religion offer people hope. It helps people find hope in the midst of the despair that often occurs in the course of serious illness and dying. Hope can change during a course of an illness; early on the person may hope for a cure; later when a cure becomes unlikely, the person may hope for time to finish old projects, travel, make peace with loved ones, with God, and have a peaceful death.

So, we have survey data that tell us our patients think spiritual issues are central in life and particularly in death and dying. We have some data that suggest that people use their spiritual beliefs in coping with chronic illness and loss. Yet we have systems of care that do not incorporate spirituality into the care of patients.

Medical professionals are recognizing these inadequacies in the healthcare system in terms of care of the dying. The American College of Physicians convened an end-of-life consensus panel where they concluded that physicians should extend their care for those with serious medical illness by attentiveness to psychosocial, existential or spiritual suffering.

The interest in spirituality in medicine among medical educators has been growing exponentially. Medical schools are now teaching courses in end-of-life care and in spirituality and medicine. Only one school had a formal course in Spirituality and Medicine in 1993. Now over seventy medical schools are teaching such courses. The key elements of these courses have to do with listening to what is important

to the patient, respecting their spiritual beliefs, and being able to communicate effectively with patients about their spiritual beliefs and about the patients preferences at the end of life.

The Association of American Medical Colleges (AAMC) in 1998, responding to concerns by the medical professional community that young doctors lacked these humanitarian skills, has undertaken a major initiative – The Medical School Objectives Project (MSOP) to assist medical schools in their efforts to respond to these concerns. The report notes that "Physicians must be compassionate and empathetic in caring for patients...they must act with integrity, honesty, respect for patients' privacy and respect for the dignity of patients as persons. In all of their interactions with patients they must seek to understand the meaning of the patients' stories in the context of the patients,' and family and cultural values." So, in recognition of the importance of teaching students how to respect patients' beliefs, AAMC has supported the development of courses in spirituality and medicine. There are currently over half of U.S. medical schools with courses in spirituality and medicine, many of which are required and integrated into the curriculum. In these courses, doctors-to-be learn how to communicate with patients about the patients' spiritual beliefs. A spiritual history is really nothing more than listening to your patient- to your patient's fears, hopes, to their beliefs. In the course of talking with someone about their spiritual beliefs, it is natural to bring up issues of advance directives...how the person wants to live and how they want to die.

The response to these courses is positive. Students and practicing physicians find their relationships with their patients are warmer, more meaningful, and deeper once they talk with their patients about their spiritual beliefs. Doctors who felt burned out by the hectic schedules of managed care now feel this gives them a way to reconnect with their patients and bring compassionate care giving back into the practice of medicine. Most importantly, the patients are happier because their whole person is treated (body, mind and spirit) and not just their illness.

It should be the obligation of all physicians to respond to, as well as attempt to relieve, all suffering if possible. Therefore, physicians and other caregivers should communicate with their patients about their patients' spirituality and the way their patients cope with suffering. We should have systems of care which allow for people to die in peace, to die the way they want to, to be able to engage in those activities that bring peace to them: prayer, meditation, listening to music, art, journaling, and sacred ritual.

Our culture, as a whole, needs to look at dying very differently from the way it currently does. We need to see dying as a natural part of life that can be meaningful and peaceful. We all need to live life now, knowing that one day we will die. By thinking about our mortality early in life, we will be not be caught off guard and pressured by the dilemmas of choices at the end of life. We will have had a chance to think about some of those choices sooner and to come to peace with our mortality. This is where religious organizations can be particularly helpful. They can facilitate our discussions of dying and what that means to us. They can educate their members about the importance of preparing themselves for the choices, both spiritual and medical, that need to be made near the end of life. We can jointly assist the dying person come to peace in life's last moments.

Of all life's difficult yet important experiences, dying may be the most difficult one we will ever have. The moment of death, and the dying that precedes it, brings to a close the journey that each one of us has been on. WE are the privileged persons who attend people while they are dying, be they our patients or our loved ones and friends. We are the persons who can bring hope and comfort to dying patients as they complete their lives. We need to ensure that our society and our systems of care preserve and enhance the dignity of all people, especially when they are made vulnerable by illness and suffering. We need to listen to the dying and be with them, for them. The process of dying can be a meaningful one; one that we can all embrace and celebrate rather than fear and dread.

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Walter C. Willett, M.D., Dr. P.H.

Dr. Walter Willett is Professor of Epidemiology and Nutrition and Chairman of the Department of Nutrition at Harvard School of Public Health and Professor of Medicine at Harvard Medical School. He grew up in Madison, Wisconsin, attended Michigan State University, and graduated from the University of Michigan Medical School before obtaining a Doctorate in Public Health from Harvard School of Public Health. Dr. Willett is a co-investigator of the Nurses' Health Study I, a cohort of over 121,000 female registered nurses 30-55 years of age who completed a mailed questionnaire that included items about known or suspected risk for cancer and cardiovascular disease. He is Principal Investigator of the Nurses' Health Study II, a prospective cohort investigation established in 1989 with over 116,000 female registered nurses. This study is designed to examine the association between lifestyle and nutritional factors and the occurrence of breast cancer and other major illnesses.

In addition to his work with the Nurses' Health Studies I and II, Dr. Willett initiated in 1986 a parallel prospective study of diet in relation to cancer and cardiovascular disease among 52,000 men, the Health Professionals Follow-up Study. He has published over 650 articles, primarily on lifestyle risk factors for heart disease and cancer, and has written the textbook, Nutritional Epidemiology, 2nd edition that came out in May 1998. Much of his work has focused on dietary determinants of heart disease and cancer.

Overview of CAM and Nutrition and Wellness

Walter Willett, M.D., Dr.P.H.

1. The distinction between nutrition and CAM is generally unclear, in part because nutrition is typically given little attention in standard medical practice. This is the result of several factors, including a weak body of evidence until recently, minimal training of physicians in nutrition, and lack of reimbursement to physicians for time spent in dietary assessment and counseling.
2. In some areas, topics that were in the sphere of CAM have moved to the mainstream in medical research and practice, including the use of antioxidant and other supplements.
3. During the last decade, large prospective studies have provided strong evidence that diet is more important than previously thought for the prevention of disease, and that it acts in different ways than we had appreciated. These effects include, for example, adverse consequences of partially hydrogenated oils and benefits of whole grains in relation to risk of coronary heart disease. Until recently, the healthy versions of many foods were often only available in health food stores, but they are now becoming available more generally. Other findings, for example, have documented that supplements of folic acid, one of the B-vitamins, have a profoundly beneficial effect in reducing birth defects. Also, the high rates of colon and breast cancer and coronary heart disease in the U.S. are probably in part due to lack of adequate folic acid. Other diseases that were not thought to be related to diet, such as cataracts, appear to be at least in part due to suboptimal diets.
4. The magnitude of reductions in cardiovascular disease and some cancers that can be achieved by diet and lifestyle is large. For example we have calculated that over 80% of heart attacks, and over 70% of strokes and colon cancer could be avoided by not smoking, regular exercise, and good diets.
5. The largest and most rapidly growing nutritional problem in the U.S. is overweight and obesity. Unfortunately, there is great debate about aspects of diet that might help to reduce obesity, but the basic long term studies that are needed have not been conducted. Moreover, funding to do such research is difficult to obtain, in part because of entrenched viewpoints and because such studies are often viewed as pedestrian, even though they are essential for making informed decisions.
6. While further research on diet and weight control is needed, we do know enough to begin controlling the obesity epidemic. This will include a central role of health care providers, educators, parents, and governments to encourage regular physical activity, limit television watching, and promote healthy diets.

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Bland

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Jeffrey Stewart Bland, Ph.D., F.A.C.N., C.N.S.

Biographical Information

Born in Illinois in 1946, Jeffrey S. Bland earned BA degrees in chemistry and biology from the University of California at Irvine in 1967, and his doctorate in biochemistry from the University of Oregon in 1971. From 1971 to 1983 Dr. Bland was a chemistry professor at the University of Puget Sound in Tacoma, Washington. From 1978 to 1982, as a Registered Clinical Laboratory Director, he directed the Bellevue Redmond Medical Laboratory in Washington State.

The first of Dr. Bland's more than 200 publications "The Influence of Tocopherol (Vitamin E) on the Photohemolysis of Human Erythrocyte," was published in 1972.

From 1978 to 1982 Dr. Bland was president of the Seattle-based Northwest Academy of Preventive Medicine. In 1982 he took a two-year sabbatical leave from University of Puget Sound to direct the Nutritional Supplement Research Laboratory at the Linus Pauling Institute of Science and Medicine in Palo Alto, California.

Dr. Bland's professional book credits include *Medical Aspects of Clinical Nutrition* (1981), *The Year in Nutritional Medicine-1983*, and *The Year in Nutritional Medicine-1984*. His consumer books include *Your Health under Siege: Using Nutrition to Fight Back* (1982), *Nutraerobics* (1984), *The 20-Day Rejuvenation Diet Program* (1996), and *Genetic Nutritioneering* (1999). Since 1982 he has produced an audio newsletter, *Functional Medicine Update*, which reaches 2000 health practitioners in 30 countries. Since 1976 he has also presented annual seminars in medical nutrition to physicians around the world.

In 1984 Dr. Bland resigned his academic appointment at the University of Puget Sound to form his own company, HealthComm International; to educate health practitioners in the successful clinical practice of functional medicine. Dr. Bland developed a clinical research facility, which in 1995 became the Functional Medicine Clinical Research Center. From 1985 to the present HealthComm International has developed a line of medical foods, UltraBalance Medical Foods, to provide nutritional support for individuals suffering from a number of chronic illnesses.

From 1975 to 1995 Dr. Bland taught nutrition courses at National Nutritional Foods Association and Natural Foods Exposition meetings. In 1993 he founded the Natural Products Quality Assurance Alliance. This group of natural products industry leaders developed a Quality Assurance Document, which helped facilitate passage in 1995 of the Dietary Supplement and Health Education Act (DSHEA).

In 1992, Dr. Bland and his wife Susan founded the Institute for Functional Medicine (IFM) to support the concept of patient-centered medicine focused on improvement in physiological function. Since 1992, IFM has held seven International Symposia and published two textbooks, including *Clinical Nutrition: A Functional Medicine Approach*, in 1998.

In 2000 HealthComm International merged with its strategic partner, Metagenics, Inc. Dr. Bland became President and Chief Science Officer of Metagenics. The company engages in clinical and health science research, medical education, product development, and quality assurance.

FUNCTIONAL MEDICINE AS A STRUCTURED SCIENCE-BASED COMPLEMENTARY AND ALTERNATIVE MEDICINE NUTRITION CURRICULUM

*Jeffrey S. Bland, Ph.D., F.A.C.N., Chairman,
Institute for Functional Medicine*

*David Jones, M.D., F.A.A.F.P., President,
Institute for Functional Medicine*

INTRODUCTION

The *Institute for Functional Medicine* (IFM) is an *Accreditation Council for Continuing Medical Education* (ACCME) qualified educational institute offering continuing medical education (CME) programs to medical providers. *Functional medicine* incorporates work that is emerging within the field of functional genomics, which is anchored in the basic sciences of cellular biology and genetics.^{1,2} The term describes a medical practice that relies on cellular biology and modern nutritional biochemistry in its clinical applications, and is deeply linked to data emerging from the Human Genome Project, which identifies the structure of the human gene. As stated in the *Journal of the American Medical Association*, “The knowledge gained by these studies will provide a vital tool for the study of many biological processes and will have a profound impact on clinical medicine.”³

Functional medicine is science-based health care that employs a systematic, patient-centered approach to understanding the underlying physiological factors and effects that influence health and the progression of disease. It is a field of health care dedicated to understanding and intervening to improve the molecular mechanisms that influence chronic illness. Embedded in this systematic approach is the functional integration of evidence-based best practices of established and emerging healthcare into an effective and cost-efficient approach to treatment that can be taught to practitioners and delivered to patients. Functional medicine has a specific focus on *preventive services* and *age-related illnesses*, both acute and chronic. Additionally, by building on the information emerging from the Human Genome Project, including genetic transcription and cell signaling, fundamental defects in cellular biology can be considered and assessed in identifying mechanisms of disease.⁴ A core therapeutic outcome from the functional medicine paradigm is molecular nutrition and dietetics.

Medical doctors who attend functional medicine CME activities have been trained in conventional medical schools and adhere to the standards of the American Medical Association and its related boards. These physicians are drawn to functional medicine because it bridges the gap between conventional medical practice and a progressive, evidence-based functional medical care approach that is firmly rooted in the sciences. These physicians are seeking ways to apply in clinical practice the knowledge gained from the literature they are reading in their peer-reviewed journals.⁵

Physicians also need (and want) to address adequately the concerns of their patients who are reading extensively in the lay literature about nutrition and health care. Doctors must obtain reliable information from the peer-reviewed literature on nutrition and its influences on health so that they can, in turn, educate their patients and help them avoid dangerous misconceptions.⁶

Recent studies reported in the October 1998 issue of the *American Journal of Clinical Nutrition*, indicate that less than 6% of medical school graduates now receive adequate nutrition training. A consortium of organizations, including the American Society for Clinical Nutrition (ASCN), the American College of Nutrition, and the American Dietetic Association, among others, report on current nutritional education for medical doctors. They point out that, despite a Congressional mandate to improve nutrition education in all U. S. medical schools, the presence of scientific data to support nutritional medicine, high public interest and government reports, such education remains inadequate. The president of the ASCN, Dr. Greenwood, has been quoted as stating that, “until physicians are better trained to provide high levels of information on nutrition, Americans are missing countless opportunities to take advantage of the growing body of scientific research on the role of diet in preventing and treating disease.”⁷

Physician-level, clinically relevant nutrition training is a core competency of the Institute for Functional Medicine. The growing body of scientific evidence provides a basis for incorporating nutritional information into the assessment of a patient’s chief complaints and for considering whether nutritional interventions might alter the course of the patient’s illness. There is no other group in the United States today offering integrated, sophisticated, science-based, clinical nutrition education for physicians at a comparable level of excellence.

PRINCIPLES OF FUNCTIONAL MEDICINE

The five core principles of functional medicine are described below:

1. *Biochemical individuality based on genetic and environmental uniqueness (Functional Genomics)*

Important to functional medicine is the concept that lifestyle translates into quantifiable effects on health through well-known biochemical and genetic mechanisms. An individual's genetic profile will set the stage for a range of possible induction scenarios, and lifestyle factors will modify expression within that range of possibilities.^{8,9,10}

For example, among apparently healthy people, the activity of liver enzymes involved in detoxification, measured through caffeine clearance studies, may vary among individuals by four- to seven-fold.¹¹ Individualized therapy using appropriate nutritional support may result in improvement and normalization of enzyme activity.^{12,13}

Other studies in this field identify relationships between certain chronic neurological disorders and impaired detoxification. Some studies suggest that individuals who develop Parkinson's and Alzheimer's diseases may have detoxification impairments (pharmacogenetics) that increase their susceptibility to the neurotoxic effects of certain chemicals, which unfortunately have become more prevalent in industrialized countries in the 20th century.^{14,15}

2. *Patient-centered versus disease-centered.*

Functional medicine focuses on the interaction between the host and his or her internal and external environment and the processes that go awry in this relationship. Disease nomenclature is only one of the steps in the functional assessment of patient's medical concerns. More important than the simple assignment of a disease name, is the understanding that disease devolves from dysfunctional responses to internal and external stressors. From a functional medicine point of the view, the patient must be seen in the context of their unique biochemistry embedded in an environmental context which washes over and through this unique genetic landscape.

Recognition of antecedents to imbalance, including genetic susceptibilities, lifestyle habits and emotional factors, is an important focus of the comprehensive patient workup in the functional medicine approach to evaluation and treatment. In an imbalanced state created by these antecedent factors, a cascade of untoward events can evolve. Disease triggers, such as infection, toxic insult, emotional trauma, can set in motion physiological chemical mediators, such as cytokines or prostaglandins. These mediators may devolve into destructive physiological processes which progress indefinitely unless prevented from doing so by intervening factors or by compensatory mechanisms within the body itself.¹⁶

Findings in molecular medicine suggest that modifiers of gene expression are ubiquitous in the food we eat, the air we breathe, and the water we drink. Our diet and our environment are, in effect, constantly communicating and interacting with our genes to modify their expression as part of the body's inherent physiological response. Such external cues can have a profound effect on biological function. A physician using integrative functional medicine principles would examine the unique set of antecedents, triggers and mediators for each patient when assessing the underlying mechanisms of the presenting signs and symptoms. This approach enables the physician to focus more directly on the unique set of circumstances leading to the patient's dysfunctions.^{17,18}

3. Dynamic balance of internal and external factors.

Integrative functional medicine physicians address lifestyle habits that impact the internal milieu and assess the dynamic interaction between internal and external environment. For example, evidence continues to grow that oxidative stress (from external triggers such as the respiratory burst response of the immune system to infection) and defects in energy metabolism (internal factors such as mitochondrial anti-oxidant insufficiency) may contribute to a number of dysfunctional processes, including neurodegenerative diseases.¹⁹

Several recent studies point to the complex mechanisms at work in the gastrointestinal tract to prevent and correct imbalances that may occur from external insults or internal miscommunications.

Examples of this include the mitochondrial damage occurring as a result of NSAID use,²⁰ recognition of variations in gut immunity in dealing with altered nutritional states,²¹ the influence of sugar malabsorption in the development of abdominal distress in functional bowel disorders,²² and the links between nutritional factors and Crohn's disease.²³

Another noteworthy area that has had a great deal of recent study involves the development of type 2 diabetes mellitus. The interplay of nurture (external lifestyle habits and emotional context) and nature (internal response) are well represented in the progression from leptin resistance to hyperinsulinemia, insulin resistance and the expression of upper body obesity. This dynamic imbalance of external and internal factors sets the stage for the progression to diabetes and its complications.²⁴ In addition, metabolic changes that may account for the development of diabetes in non-obese patients ("metabolically obese") are now being explored. If these factors are identified early, physicians may be able to help patients prevent the onset of NIDDM.²⁵

4. Complex relationships and connections among physiological factors.

Fundamental to integrative functional medicine is a profound awareness of complex, web-like interactions among all systems. The research in psychoneuroendocrino-immunology is a prime example of the web-like interconnectedness.²⁶ The antecedents of our patients' dysfunctions rest within the complex web of their biological terrain and the translation of their genetic susceptibilities. A few examples of interesting research documenting this complexity include the following:

- The role of nutrients in the balance of physiological processes continues to be clarified. The mineral chromium, for example, is effective in improving glucose tolerance and may be beneficial in controlling diabetes mellitus.²⁷ Oxidative stress continues to be recognized as a key imbalance in a myriad of disease processes; in particular, it can lead to the induction of mediators of inflammation and a cascade of injury and biological damage. Antioxidants normally used by the body in countering the effects of oxidative stress may be lowered by an ongoing inflammatory process, and supplementation may be beneficial.²⁸

- Dr. Bruce Ames, Professor of Biochemistry and Molecular Biology, and Director of the National Institute of Environmental Health Science Center, University of California, Berkeley, presented his research in nutrition and aging at the 7th International Symposium on Functional Medicine in May 1999, Scottsdale, Arizona. One of his research projects has focused on the interplay between the oxidative damage to germ cell DNA in young smoking men who are deficient in folate and vitamin C. The children of these men show a significant increase in cancer when matched with a non-smoking cohort.
- Nutrition plays an important role as well in the maintenance of a healthy endocrine system. Under-nutrition may contribute to detrimental alterations in the pituitary-adrenal axis, for example.²⁹ (The role of nutrition in maintenance of a healthy gastrointestinal tract was discussed briefly above.)
- A rich literature exists on the genetics and epidemiology of aging and chronic illness.³⁰ Evans and Rosenberg have identified biomarkers that can be measured in assessing organ reserve and healthy aging.³¹ Observing the effects of lifestyle, environment, and mental state on overall health, and measuring specific underlying physiological processes to aid in assessment, are key components of the integrative functional medicine approach.

5. *Health is not merely the absence of disease.*

Loss of function is generally a gradual phenomenon. Individuals do not just become ill one day and cease to function adequately. The process is progressive and long-term in most chronic illness. Dr. James Fries of Stanford University Medical School explains that the loss of function associated with disease among older individuals is a consequence of the progressive loss of organ reserve.³² Stresses that could at an earlier time be accommodated now exceed the organism's resilience, which results in a health care crisis. Fries emphasizes that organ reserve is related to biological age. We can modify how quickly we lose organ reserve and undergo biological aging through changes in lifestyle, environment, and nutrition. ***It is now recognized that 75 per cent of our health and life expectancy after age 40 is modifiable on the basis of such choices.***^{33,34,35,36} Surely it is incumbent upon us as physicians – and as citizens interested in lowering the cost of health care – to integrate this knowledge into clinical protocols.

Measures of function have been shown to be important in predicting mortality for older, hospitalized patients. A recent article in the *Journal of the American Medical Association* recommended that functional status variables be included in risk assessments.³⁷ Dr. Naoki Ikegami recently eloquently expressed, in a letter to the *New England Journal of Medicine*, that functional assessments should be included in risk assessments for aged patients.³⁸

This growing body of research emphasizes that loss of function is gradual and modifiable, a central principle in functional medicine.

The Institute for Functional Medicine recognizes the importance of basing educational programs firmly in the medical sciences and takes into consideration the scope of clinical practice of the medical doctor. Within that context, integrative functional medicine is dedicated to helping physicians improve patient outcomes, and thereby helping patients to longer, healthier lives.³⁹

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CHAPTER CONTENTS

PART I: THE PHILOSOPHY OF FUNCTIONAL MEDICINE 3

Introduction 3

Theoretical aspects 4

- The philosophy of function in a medical context 4
- Function as a mediator for opposition thinking in the sciences 5
- Body systems from a functional medicine perspective 8

PART II: THE CLINICAL APPLICATION OF FUNCTIONAL MEDICINE 10

Basic concepts in functional medicine practice 10

Assessment and treatment from a functional perspective 11

Summary 15

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Functional medicine in natural medicine

Buck Levin, PhD RD

Michael A. Schmidt, PhD CNS

Jeffrey S. Bland, PhD

PART I: THE PHILOSOPHY OF FUNCTIONAL MEDICINE

INTRODUCTION

This textbook bears witness to the remarkable evolution of naturopathic medicine in the USA since Benedict Lust first opened his American School of Naturopathy at the end of the 19th century. During the intervening century, naturopathic physicians have become recognized as primary health care providers in about one-fourth of all states; naturopathic practice has become part of publicly funded clinics, and accredited training has become available in all regions of the country. In addition, naturopathic philosophy has influenced medical philosophy as a whole, including the functional approach which we have espoused in our own work. Naturopathic recognition of key medical principles, including *tolle causam* (identify and treat the causes), *primum non nocere* (first do no harm) and *docere* (doctor as teacher), has helped us clarify our vision of a functional approach to health which derives from a patient-centered, self-care, outcomes-based model.

Through functional medicine, we have worked to develop an approach to health care which can be incorporated into the everyday practice of all health care practitioners regardless of training or specialty. Moreover, we have tried to carve out an approach which capitalizes not only upon the foremost accomplishments of basic and applied science, but also upon the strengths of specialty fields and specialized approaches to clinical practice. It is our hope that naturopaths, osteopaths, chiropractors, medical doctors, nutritionists, dietitians, herbalists, homeopaths, acupuncturists, Ayurvedic physicians, and other diversely trained practitioners will be able to find in functional medicine an approach which naturally extends and enhances their current practice. Functional medicine is not an "alternative" approach which requires a change in basic clinical orientation or political allegiance. It requires only a willingness to take

seriously one's basic medical philosophy, and to engage the science of our time with the spirit of true discovery, open-mindedness, and due diligence. In this chapter, we specifically address the consequences of such an approach for naturopathy and its clinical practice.

THEORETICAL ASPECTS

The philosophy of function in a medical context

Most dictionary definitions of "function" indicate that the word is derived from the Greek term *ergon*, which means "the kind of action or activity proper to a person or thing; the purpose for which something is designed or exists".¹ This definition tells us the concept of function must be viewed in the same category as the concepts of "purpose" and "design". It tells us we cannot understand the function of a person or thing without also understanding the purpose for which that person or thing is designed.

In early Greek philosophy, the term *ergon* was frequently contrasted with the term *pathemata* – things that happened to a person or thing.² This comparison focused on the difference between things with the capacity to act (*poiein*) and things that were, in contrast, "passive activations" (*pathe*).² *En-ergia* – being in activity, or functioning – was considered to be the *telos* (end purpose) of being alive. Today, when we refer to disease as "pathology-based", we are actually linking disease, etymologically, to this realm of *pathemata* and *pathe*. We are defining disease as something that "happens to" a person, something that is not a part of that person's purposeful activity. Etymologically, the term "functional medicine" moves us away from this pathological model and aligns us with a medicine that views disease as part of something that is purposeful and is proceeding actively in accordance with some design.

The history of philosophy – at least as far back as the writings of Aristotle in the third century BC – has witnessed an ongoing debate between "vitalistic" and "mechanistic" approaches to life and health. Naturopathic medicine has consistently aligned itself with the vitalistic side of this argument. Naturopathy recognizes a vital force – *vis medicatrix naturae*, or healing power of nature – that is present in all living things, including the human body. For naturopaths, it is this vital force which is ultimately responsible for healing.

The functional medicine emphasis on purpose and design is closely related to this recognition of vital force in naturopathy. When functional practitioners recognize purpose and design in physiological events (including "disease of unknown origin"), they are acknowledging that body function is guided by a universal, supra-individual set of principles. They are acknowledging that physiological function originates from an infinite,

complex, patterned matrix of occurrences which both precede and transcend individual human experience. The purpose and design of functional medicine therefore echo the spirit of vitalism.

This spirit of vitalism does not mean, however, that the healing force is totally mysterious or unapproachable. While the universal, patterned matrix of events is infinite and cannot be fully understood, it is nevertheless a complex pattern which can be observed and analyzed within the limits of a human perspective. Pursuit of this possibility is essential to a functional approach. The more that can be learned about the patterned matrix of universal events, the better able is the practitioner to support healing.

The terms "form" and "function" are probably most familiar to us from the field of architecture. At the turn of the 20th century, US architect Louis Sullivan coined the phrase "form follows function", recognizing that purpose precedes the blueprint. But in our philosophy of the body's architecture, how do these terms apply? In the case of several body systems – the musculoskeletal system or the circulatory system, for example – shape and form give an initial hint about function, design, and purpose. It is difficult to observe the body's skeleton without concluding that it has been designed for structural support. With other physiological systems, these connections are not nearly so obvious.

Phrenology, described by English historian J. C. Flugel a century after its origin as "psychology's greatest *faux pas*", argued that the quality of a person's mental faculties was determined by the size of the brain area upon which those faculties depended, and this quality could be judged by the contours of the skull adjacent to the area.³ This literal equating of brain function with brain form, proposed in 1810 in Paris by François Joseph Gall and his student J. C. Spurzheim, met with some immediate difficulty in application. After discovering that the skull of French philosopher René Descartes was particularly small in the anterior and superior regions of the forehead, understood to be the seat of a person's rational faculties, Spurzheim reportedly commented:³ "Descartes was not so great a thinker as he was held to be."

The inability of phrenologists to make sense of function by reference to form alone is one example of a difficulty that continues to permeate 20th century medicine. Naturopathy has made great strides in linking form with function, by accommodating into its practice longstanding medical traditions which treat function by working with form. Naturopathy's embrace of physical medicine – from craniosacral therapy and osseous manipulation to hydrotherapy and physiotherapy – has made the connection between form and function more accessible.

A final common ground between functional and

naturopathic medicine involves the very idea of a "medical philosophy". The need for practical solutions in everyday medical practice is great (so great that most practitioners will not see themselves as having the time – or inclination – to "philosophize"). Yet from a functional and naturopathic perspective, it is impossible to approach health without paying continual attention to one's *philosophy* of medicine. In the remainder of this section, we look at several examples of philosophical thinking that we believe continue to represent stumbling blocks for an integrated 21st century medicine. Each of these examples thinks "dualistically" about medical concepts and in so doing, we believe, loses sight of function.

Function as a mediator for opposition thinking in the sciences

Part/whole

The traditional philosophical dualism of "part/whole" has been directly addressed in the field of holistic health. Two national organizations – the American Holistic Health Association (AHHA), with headquarters in Anaheim, California, and the American Holistic Medical Association (AHMA), located in Raleigh, North Carolina – have each referred to this dualism in defining their field of study.

According to the American Holistic Health Association:⁴

Rather than focusing on illness or specific parts of the body, holistic health considers the *whole person* and how it interacts with its environment. It emphasizes the connection of body, mind, and spirit. Holistic Health is based on the law of nature that *a whole is made up of interdependent parts*. The earth is made up of systems, such as air, land, water, plants, and animals. If life is to be sustained, they cannot be separated, for what is happening to one is also felt by all of the other systems. In the same way, an individual is a whole made up of interdependent parts, which are the physical, mental, emotional, and spiritual. When one part is not working at its best, it will impact all the other parts of that person. Further, this whole person, including all of the parts, is constantly interacting with everything in the surrounding environment.

And according to the American Holistic Medical Association:⁵

Wellness is defined as a state of well-being in which an individual's body, mind, emotions, and spirit are in harmony with and guided by an awareness of society, nature, and the universe. ... [It] encompasses all safe modalities of diagnosis and treatment, including the use of medications and surgery, emphasizing the necessity of looking at the whole person.

On its Internet website, the AHMA states:⁶ "Optimal health is much more than the absence of sickness. It is the conscious pursuit of the highest qualities of the spiritual, mental, emotional, physical, environmental, and social aspects of the human experience."

With respect to their characterization of "part" and "whole", these definitions of holistic medicine are largely compatible with a functional approach. Because the concept of function asks us to consider why a thing is here, i.e., what it is "doing" in the universe, it asks us to be holistic and take into account the *holon* – which in early Greek philosophy meant both "universe" and "organism". Wholeness becomes a necessary concept for understanding function, and holistic medicine has done medical philosophy an important service by renewing its focus on the whole.

At the same time, we invite supporters of holistic medicine to consider an extension of their philosophy in two ways. First, we invite consideration of a multi-level understanding of wholeness that does not predetermine a frame of reference or specific context in which wholeness is to be evaluated. For example, if we do not presently know whether planetary indices of geomagnetic disturbance – such as sunspot relative number, area, and geomagnetic activity – are as valuable a "whole" or "universe" against which to evaluate and treat cardiovascular disease as homocysteine imbalances (the "whole" or "universe" of the cell) or "heartlessness" and "disheartenment" (a psychological or sociocultural "whole" or "context"), we might expect to benefit by keeping a radical open-mindedness about frames of reference, levels of wholeness, and their ultimate inter-relationship in a holistic model. Instead of trying to simplify with three or four frames of reference based on early 20th century psychology (i.e., wholeness as the sum of physical, emotional, mental, and spiritual frames of reference) or a few contexts based on specialty (physical body, immediate external environment, global environment), we might simply postpone such conclusions until we learn more about levels of wholeness and their relationship. From a functional perspective, we suspect this relationship will closely resemble the one described by US engineer, designer, and architect, Buckminster Fuller, in his discussion of "functions" in his 1975 opus, *Synergetics*.⁷ "Functions occur only as inherently cooperative and accommodatively varying subaspects of synergistically transforming wholes."

The relationship of part to whole is a second area in which a holistic perspective could be logically extended. We believe the concept of function necessitates a view of "part" and "whole" that is quite different from the image of a disassembled jigsaw puzzle or a shattered china teacup, which can be reassembled or glued back together to re-establish the "whole" from which it came. In both of these examples, the parts have a visible connection to the whole, but in and of themselves are a diverse array of pieces in all shapes and sizes, bearing no individual resemblance to the whole from which they came. From a functional perspective, we believe this image of part and whole should be changed. Instead of

a shattered teacup or a disassembled puzzle, we propose a shattered *hologram*. When a hologram breaks, it does not shatter into discrete pieces with different sizes and shapes that individually bear no resemblance to the original hologram. It splits into separate pieces, each of which visibly contains the complete and original hologram.

From a medical perspective, this change means that we would stop assigning partial functions to anatomically distinct body parts or systems and begin treating all parts as visibly containing the original hologram, i.e., whole-body capability. For example, we have traditionally viewed the gastrointestinal (GI) tract, brain, and immune system as separate, identifiable parts unable to carry out each other's basic functions. In the case of the GI tract, these functions have traditionally been limited to digestion, absorption, secretion, and motility. We now know the GI tract has its own immune system (GALT) and its own brain (memory T-cells disseminated to the intestinal epithelium and lamina propria providing the functional basis for oral tolerance),⁸ and that it can carry on functions traditionally reserved for other systems of the body. Similarly, we now recognize that the eye does not simply "see". We know it helps set the body's circadian rhythms through the production of melatonin,⁹ and that it may therefore coordinate reproductive signaling as well.¹⁰ These findings encourage recognition of the whole inside each part. Equally encouraging have been the many "reflexologies" that have dotted the landscape of alternative medicine, and which have been given open-minded consideration in naturopathy – foot reflexology, iridology, intestinal reflexology in colonics, contact reflex analysis – each pointing toward a "shattered hologram" model in which the unbroken whole is visible in its seemingly separate parts.

Inside/outside

The classic debate over nature vs. nurture, heredity/environment, and genetics/experience has had troublesome consequences for a patient-centered approach to well-being. We have seen what can happen when the "insides", in their purest form, are equated with the chromosomal material inside the nucleus of the cell. What can happen is a philosophy of development that treats the three billion base pairs in the human genome as a largely unalterable blueprint working from the inside to define a person's potential with respect to the "great taskmaster outside", i.e., the environment. This extremist view of inside/outside, equating inside – the true "inner sanctum" – with the gene, has given us a national eugenics movement based on misinterpretation of ethnic differences in IQ, a national backlash against elementary school "mainstreaming" based on misinterpretation of learning disorders, and a popular anthropology of racial

difference based on misinterpretation of the anthropological facts.

Two examples from the history of biology can help place the dualism of "inside/outside" in a more functional context. The first example involves a chapter of a book written by Swiss zoologist Adolph Portmann in 1967. In his chapter, titled "The Outside and the Inside", Portmann writes:¹¹

Biologists ... have worked from the outside inwards, from what is visible and tangible to what is more and more deeply hidden. ... But such probing makes us strangers to the appearance of the living creatures around us. ... With a knowledge of the developmental conditions under which, for instance, a feather primordium develops and its pigment is formed, it is only the problem of shape that has been solved. But it still remains to be shown what brings about that special distribution of color in the pattern on the feather germ which is specifically directed towards the whole form in its final condition.

In his book, Portmann argues that outsides of animals are in fact expressions of their inwardness, i.e., their developmentally unfolding uniqueness and individuality. He also concludes that the ultimate purpose of this "insides-becoming-outsides" is to help living creatures find each other and "break the ban of isolation".¹¹

What we hear in Portmann's writing is a desire to blur (or even erase) the line between inside and outside. What is innermost "feels a desire" to become outermost and for the purpose of connecting up with the innermost sanctum of another.

As health care practitioners, we are all familiar with the notion of a *milieu interieur* – an interior, homeostatic, calm harbor maintained in the wake of outside, stormy seas. Pasteur's contemporary, Claude Bernard, first wrote about this concept in 1865 in his classic text *An Introduction to the Study of Experimental Medicine*,¹² and it still serves as a cornerstone of our understanding of cellular events. But what we are not familiar with, in this second example, is the extent to which Bernard was forced to dismiss the relevance of purpose and design in positing the *milieu interieur*.¹²

Neither physiologists nor physicians need imagine it their task to seek the cause of life or the essence of disease. That would be entirely wasting one's time in pursuing a phantom. The words life, death, health, disease have no objective reality.

Sickness and death are merely a dislocation or disturbance of the mechanism which regulates the contact of vital stimulants with organic units.

It is, of course, the interior milieu that regulates this contact. But by making such an absolute division between inside and outside, Bernard ends up placing all responsibility and focus on this "mechanism" that connects "in" with "out", and turning his back on purpose and essence of life/death and health/disease.

Both of these examples caution us against drawing

absolute lines between inside and outside. So does the concept of function itself. When we recognize that function requires purpose – some goal or end-point toward which activity is directed – we are also recognizing that function requires *potential*, a goal or end-point that is capable of being reached but has not yet been attained in actuality. Without potentiality, there is no function.

In functional medicine, no question is more critical than the question of this potentiality and its “location”. To what extent is potential “inside” of us, inside of our cells, our thought, our genes? How are “outside” events related to this potential? In immunology, at least since the end of World War II, we’ve developed a self/non-self model that is forcing us to relabel long lists of diseases as diseases of autoimmunity, diseases in which the distinction between self and non-self has become confused. But from a functional perspective, an absolute division between self and non-self is a too-literal separation of inside from out. Autoimmune diseases cannot be a set of inside, interior dynamics in which “self” mistakes “self” for “non-self” and self-destructs. If this were the case, we wouldn’t be discovering all the risk factors for autoimmune disorders on the outside, removed from the self. Yet that is exactly where we are finding them. The 17-amino acid sequence in bovine serum albumin that travels from cow’s milk formulas to pancreatic beta-cell surface proteins (protein 69) and increases risk for the autoimmune disease we call juvenile-onset diabetes,¹³ the links between xenobiotic exposure and systemic lupus erythematosus,¹⁴ and the newly designated “auto-immune polyendocrine syndromes” and their responsiveness to dietary modification are all examples that point to dangers *outside* the self and their key role in the development of autoimmune disease.

But it is not only negative potential that gets locked outside the self when we draw a line too absolutely between inside and out; it is positive potential as well. Function requires purpose. Purpose requires potential. To be “pluri-functioning” organisms, we must also be “pluri-potential”. And because the unbroken whole is visible in the parts, this pluripotential must reside in the parts as well, even in that innermost part we call the human genome, locked away inside the nucleus of the cell.

Molecular medicine is teaching us that there is no untouchable inside. Our outside experience – including our dietary intake – continually modifies the expression of our genes. Control of gene expression is highly encrypted, i.e., genes have inducer binding sites and promoter sequences that modify their expression. Numerous nutritional components have been shown to modify that expression, including linoleic and alpha-linolenic acid, isoflavones, quercetin, ellagic acid, vitamin A, and vitamin B₆.¹⁵ The potentiality is ever-present, even when IQ suggests otherwise. At our innermost, genetic selves,

we are always also outside of ourselves, linked to wholes through our potential.

Cause/effect

In the fourth century BC, in a treatise entitled *Physica*, the Greek philosopher Aristotle described a doctrine of four causes: formal cause (*eidōs*), producing in a thing its constitutive essence; material cause (*hylē*), providing a thing with its matter and embodiment; efficient cause (*kinoun*), initiating change in a thing; and final cause (*telos*), providing an ultimate purpose for the change. Since the word “cause” has several meanings, Aristotle wrote: “It follows that there are several causes of the same thing (not merely in virtue of a concomitant attribute), e.g., both the art of the sculptor and the bronze are causes of the statue.”¹⁶

What appears treatable or preventable to us as practitioners depends entirely on our philosophy of medicine. Whether dysfunction is treatable or preventable depends on what caused the dysfunction in the first place, i.e., on our concept of causality. Keith Block, MD, medical director of the Cancer Institute at Edgewater Medical Center in Chicago, Illinois, has recently argued that the labeling of any cancer as “terminal” is both scientifically and spiritually unjustifiable.¹⁷ His argument is based on a view of cancer causality that includes an active role for the self in deciphering and acting upon the cosmic event that cancer represents.

But the views of Aristotle and Block, welcoming a complex view of causality into our understanding of health, are far from our classic heritage in the sciences. As French Nobel Prize winner Jacques Monod wrote, in his classic 1970 work *Chance and Necessity*:

The cornerstone of the scientific method is ... *systematic* denial that “true” knowledge can be got at by interpreting phenomena in terms of final causes – that is to say of “purpose”.¹⁸

Against this notion, this powerful feeling of destiny, we must be constantly on guard.¹⁸

Monod’s philosophy is our reigning medical philosophy – a philosophy steeped in the Darwinian legacy of a universe with minimal original essence, minimal momentary stability, and an indefinite horizon of possibilities.¹⁹ It is a philosophy that tells us we must be careful when reading purpose into dysfunction, and that we should accept whole categories of disability and death as purposeless, chance events that are essentially not preventable.

Naturopathy, with its focus on prevention, has helped to transform this perspective. Most naturopaths would readily subscribe to the mission statement of the Foundation for Preventive Medicine, based in New York City, when it describes its mission as “enhancing the public’s awareness of recent information indicating that most

causes of death in our society ... are now regarded as potentially preventable". Preventive, functional, and naturopathic medicine all seem to agree that lack of well-being, lack of vitality, depression, and deficiency in energy are also associated with largely preventable conditions,²⁰ and that each time we transfer a health condition from the category of "not preventable" to "preventable", we are honoring our medical philosophy.

Energy/matter

As scientists, most of us subscribe to an energy-based view of human function. We believe that healthy function rests on the shoulders of gated ion channels, electrolyte balance, membrane potential, redox, electrochemical gradients, and high-energy phosphate bonds. In our view, the release of heat energy from cells is what makes biological order actually possible in the first place.²¹ Yet in spite of its acceptance at a biological and biochemical level, this energy-based paradigm has yet to become fully integrated into our *medicine*. While electrocardiographic, magnetic resonance, and single photon emission imaging have become standard parts of our diagnostic repertoire, electroacupuncture biofeedback devices, despite their research record and use in many countries,²² remain unapproved for clinical use in the USA.

Once again, naturopathic medicine has provided leadership in this area. Energy-based medicine has been given open-minded consideration in naturopathy, and whole traditions based on principles of energy, including acupuncture and Oriental medicine, have been treated as essential areas for understanding and research. Similarly, acceptance of homeopathy, an energy-based medicine used by a quarter of a million practitioners worldwide,²³ has been nurtured in the USA by the supportive position adopted by naturopaths and naturopathic institutions.

From a functional perspective, the rightful place of "energy medicine" in health care approaches is woven into the term "function" itself, which derives from the Greek *en-ergia*, literally "functioning" or "being in activity". But clearly, as practitioners, we are just starting to explore this energy-matter relationship in our medical philosophy. In nutrition, for example, we are just beginning to shed our 19th century steam engine model, which perceives the body as a large furnace combusting matter (food) for the sake of extracting caloric energy. In this model, energy is not useful unless extracted out of matter, and matter, once depleted of its energy, is of little use as well. This food-as-fuel model has left us with an under-appreciation of food's matter and its energy. As raw material for caloric extraction, food becomes most important for its gross, undifferentiated macronutrient content – its 20 g of fat or 100 g of carbo-

hydrate. Subtler distinctions involving omega 3:omega 6 or oligosaccharide:polysaccharide ratio have been slow to evolve. Likewise, food energetics – including the issue of raw food, live food, food enzymes, and active cultures – have been negligibly addressed. Interestingly, we are finding the role of light – in the form of food pigments, including the hemes, chlorophylls, carotenoids, and flavonoids – is slowly revolutionizing our approach to food in the same way that light (and the frame of reference it represented) revolutionized our approach to mass and energy in physics.

Body systems from a functional medicine perspective

Historical and philosophical perspective

Students of science and medicine in the USA and other Western countries learn anatomy and physiology from a systems approach. They learn to view organ systems, individual organs, tissues, cells, and subcellular spaces as separate entities that interact with one another to create form and function. The better one understands any one system or entity, by this model, the more skilled one will be at treating dysfunction of that entity. This model served well in developing a rational method of inquiry into the etiology of many diseases. Indeed, the advancement of medical science has long been measure by progress made in understanding the mechanisms of disease related to dysfunction in the body's distinct compartments.

Fundamental to the systems model has been the assumption that the more we know about individual organs or systems, the better our medicine will be. Until very recently, this assumption had been widely validated throughout medical history by remarkable progress in diagnosis and treatment of disease, surgical practice, and the development of medications for symptom reduction related to specific diseases.

The progress that resulted from this compartmentalizing approach can be compared to advances in biology that followed Linnaeus's development of a system of taxonomic classification of living organisms in the 18th century. The formalized system of learning allowed for significant advancement in the field of biology. By the 1970s, however, many biologists had become aware of the limitations of description and classification as an epistemology. Their science had outgrown the model. Through advancements in the disciplines of ecology and environmental science, they knew they could classify all the plants and animals in an ecosystem and yet understand nothing about the functioning of the ecosystem as an integrated whole. The need had arisen to address the larger issues of how compartments within the ecosystem interacted to give rise to its function and survival.

From the perspective of these advancements in biology, one could view medicine as a specialized discipline within the broader field of human ecology. To understand health and disease, one would be required to examine the functional interaction of organ systems with the human environment. Furthermore, one would have to observe the functional interaction between the total human environment and the energy processing and control systems within it.

Examining any discipline from a new point of view makes it possible to ask new questions and gain new insights. Looking at human health and medicine from the point of view of interactive function raises questions about the homeodynamic interplay between the external and internal environments of the individual. The functional viewpoint is the longer, larger view; it moves away from the narrow focus on pathology of various parts of the body. It removes the principal focus from diagnosis of pathology and places it on evaluation of genetic pluripotential and its translation into homeodynamic function. It views disease not as an enemy with which to grapple, but as a manifestation of the breakdown of mechanisms that establish control and resilience. To restore these processes, functional medicine uses a broader range of methods than the cut-and-paste tools of compartmentalized medicine. Among others, it employs nutrition, environmental adaptation, lifestyle changes, activity or stress pattern adjustment, or molecular pharmacology, and its selection of tools is based on the unique needs of the individual.

The traditional anatomy/physiology model of Western medicine still has great value in diagnosis and treatment, and it has wide application in responding to many specific disease states. This traditional model breaks down, however, when it is applied to chronic conditions that transcend individual organs or organ systems. Among these chronic health problems are inflammation, fatigue, pain, immune dysfunction, and problems of digestion. All of these conditions are characterized, not by end-stage pathologies, but by altered physiological function, and they require a more integrative model to design a therapeutic approach that can improve long-term outcome. This more integrative model is built upon the understanding that dysfunction is not compartment- or organ-specific, but is an alteration in integrated homeodynamic processes.

The functional medicine approach incorporates evaluation of antecedents to a health problem, its triggering factors, mediators of altered physiological function, and the relationship to signs and symptoms, to develop an integrated view of the patient's health status. It focuses less on defining the disease and more on understanding the functions that give rise to the expression of symptoms.

A woman may approach her physician complaining of chronic intestinal pain and symptoms of irritable

bowel syndrome, for example. A medical history and initial evaluation might uncover other symptoms, including joint pain, headache, low energy, sleep disturbances, and eczema. Rather than coming up with a primary and secondary diagnosis and prescribing symptom-relieving medications, a functional medicine practitioner would delve further in evaluating the source of the inflammation. The practitioner might assess gastrointestinal function, hepatic detoxification ability, and immunological status, and assess their relationship to oxidative stress mediators. Based on this "second tier" of assessments, the practitioner would develop an integrated approach to modify triggers and mediators using specific biological response modifiers and lifestyle alterations of the individual.

Systems integration and functional medicine

The emerging science of today has blurred distinctions among organs, and separation of function into distinct compartments is less useful as a concept. We now know, for example, that identical signalling molecules are released and received by all organ systems, and each influences the function of the others. The view of the body as a collection of separate, interconnected parts is being replaced by an image of the body as a hologram. The endocrine system synthesizes a neurotransmitter that is released by the nervous system and has a receptor site on the white blood cell. A blood cell synthesizes cytokines that are released by the immune system and have receptor sites on the glial cell in the brain. The liver synthesizes steroid hormones that are released by the endocrine system and have immune and nervous system receptors, and vice versa. In other words, all the organs and organ systems of the body are constantly engaging in "cross-communication", which makes distinctions among them a matter of definition rather than function.

In the past 10 years, medicine has witnessed a revolution in molecular biology. We now know, for example, that modifiers of gene expression are produced not only by different organs but also by exposure to various agents in the diet and environment, including chemicals and electromagnetic radiation. We have learned that the processes that give rise to an individual's health or disease are not controlled by genes alone. Instead, modification of function comes about through alteration in gene expression, transmitting new physiological messages about individual regulation and control.

This new view of health focuses on maintaining metabolic and homeodynamic freedom based on interconnectedness, pluripotential, diversity, and redundancy of function. Loss or decline in any of these parameters can be seen as an altered state of health. Altered physiological diversity, for example, translates to a loss of metabolic freedom and a subsequent state of lower

health reserve. Assessing health, therefore, depends on measuring this reserve rather than evaluating pathology. Functional challenge tests, an integral part of the practice of functional medicine, make it possible to measure specific reserves under conditions of stress. Examples of functional tests include the exercise treadmill test for cardiac function, oral glucose tolerance testing for blood sugar management, and food provocation challenges for food sensitivity.

Functional medicine practitioners use the patient as his or her own "universe", or point of reference in which his or her unique set of interconnections, potentials, diversities, and redundancies is realized. Whether changing conditions involving time, temperature, electromagnetic energy gradients, infective organisms, or trauma will lower degrees of metabolic freedom is a question that can be answered only in the context of the individual and his or her ability to maintain reserve and avoid reduced stability that comes from lost potential.

Functional medicine focuses on maintenance of stability and pluripotential across organ domains. From this perspective, all organ-specific symptoms the patient possesses at any one moment reflect homeodynamic alterations at a broad, "weblike" level and result in new metastable physiological states characterized by lowered stability and reduced degrees of metabolic freedom and efficiency. The more freedom is lost at this "weblike" level, the more symptoms will become manifest, and the more closely they will resemble classical pathology. It is the integrative, homeodynamic, regulatory role of the web that is being altered, however, not a circumscribed set of functions within a specific organ domain. As a diagnostician, a practitioner might look through a focused lens such as an X-ray, blood chemistry, or CAT scan at an isolated, compartmentalized organ system. As a functional medicine practitioner, however, he or she will view alteration in this seemingly distinct compartment as a reflection of change in the web, the whole of which is the individual and his or her unique life experience in the world.

PART II: THE CLINICAL APPLICATION OF FUNCTIONAL MEDICINE

BASIC CONCEPTS IN FUNCTIONAL MEDICINE PRACTICE

The practice of functional medicine is guided by three basic concepts: biochemical individuality, health as positive vitality, and life processes as homeodynamic.

Biochemical individuality

Each individual is unique. This uniqueness encompasses

voluntary activities, such as decision-making, personality development, and emotional response, and involuntary activities like metabolism of nutrients, cellular processing of information, and communications among the body's organ systems. The concept of biochemical individuality is central to every aspect of the practice of functional medicine, from clinical assessment and diagnosis to the broad spectrum of treatment modalities.

As traditionally practiced, medicine and nutrition have given only token consideration to the concept of individuality. In conditions such as phenylketonuria (PKU) or maple sugar urine disease (MSUD), for example, although medicine has long recognized that specific metabolic aberrations alter the afflicted individual's nutrition and health needs, it has taken the view that these defects are so rare as to be inconsequential. A functional medicine practitioner, on the other hand, considers that all individuals have unique metabolic patterns that affect their nutrition and health needs. In comparing two individuals whose blood levels of B vitamins are nearly identical, for example, one might have five times as high a level of B vitamins in his or her cells as the other. Individuals also respond uniquely to environmental toxins, food additives, and prescription medications.

Health as a positive vitality

Functional medicine views health as more than the absence of disease. Health, in the functional medicine model, is the state of positive vitality unique to each individual within his or her life context. Functional medicine employs new assessment tools to help quantify individual well-being and evaluate his or her physiological, cognitive/emotional, and physical function.

Functional medicine practitioners cannot narrowly focus on a patient's symptoms, complaints, or history of illness. They must also evaluate the patient's history of wellness by asking when in life the individual has felt best and what circumstances would be necessary to make that patient feel truly well again. Although relief of symptoms might be one goal of the application of functional medicine, the broader goal would be to support vitality in the patient's life experience.

Life processes as homeodynamic

Homeodynamics as a principle of functional medicine contrasts with the concept of "homeostasis" in conventional medicine. Homeostasis describes the balance of interconnected components that keep a physical or chemical parameter of the body relatively constant. Homeodynamics posits a similar control system functioning to maintain biochemical individuality.

Applied to the body, the term "homeodynamic" de-

scribes a range of continuously occurring metabolic and physiologic activities that enable an individual to adapt to changing circumstances, stresses, and experiences. The homeodynamics of one's health are constantly at work to enable a person to function as a unique individual. Supporting health at a homeodynamic level may require one to focus attention on cellular processes or organ function at sites that seem to be far removed from the patient's area of discomfort, and at levels that may be unusual from a conventional point of view.

ASSESSMENT AND TREATMENT FROM A FUNCTIONAL PERSPECTIVE

Healing practices in any society evolve within a cultural context and draw upon the belief systems and resources of the healers within that culture. In traditional societies, the background and support of healing derive from the natural world. In industrialized societies, evolving in a framework erected by Newton and Descartes, medicine formed a different understanding of the body and its function.

The term "diagnosis" derives from the Greek word *dia-gnosis*, which means, literally, "through gnosis, through the knowledge gained through a perspective". In conventional Western medicine, diagnosis is defined as "the art of distinguishing one disease from another" or "the determination of the nature of a case of a disease". *Clinical diagnosis* is "diagnosis based on symptoms, irrespective of the morbid changes producing them". *Differential diagnosis* is "determining which of two or more diseases or conditions a patient suffers from, by systematically comparing and contrasting their symptoms".

Key concepts in these definitions are "disease", "symptoms", and "suffers from", and analysis of these concepts yields clues to the philosophical perspective underlying the Western medical approach to managing health. This underlying perspective is the key factor that differentiates one healing system from another. It is the basis by which we examine patients and develop our plan of action or treatment. A physician whose perspective is oriented toward pharmacology views patients in terms of what drugs are needed. A nutritionist might look for specific nutrients or dietary changes that would benefit patients. A psychotherapist might ask which form of counseling or behavioral intervention is warranted. In each case, the course of action is dictated by the practitioner's underlying perspective.

The underlying perspective of functional medicine is based on process, dynamics, and purpose. Functional medicine focuses on dynamic processes that underlie and precede the pathological state. Acknowledging the existence and necessity to understand pathology, functional medicine focuses on underlying processes and seeks solutions that address these processes.

The practice of functional medicine does not focus on diagnosis that compartmentalizes diseases into known entities. Such a system, although it might be useful, is apt to presume that if we can name a disorder we can understand how it came about. Functional medicine practitioners recognize diagnosis categories, but they also investigate underlying dietary, nutritional, lifestyle, environmental, and psychosocial factors that might alter the patient's state of health and investigate the "purpose" behind the expression of illness.

Illness as information

From the traditional medical viewpoint, illness "happens" to a human being; an outside force upsets a system of the body. The clinician then seeks to discover precisely what it was that caused the illness. Although this method remains a useful view in diagnosis (since a number of factors, including food, chemicals, and microorganisms, affect our homeodynamics), it places constraints on both patient and clinician. On the other hand, if we take the view that the human body is an energy-driven, energy-sensitive system that interacts constantly with its surroundings, we can begin to view illness as a form of communication from one level to a level of conscious awareness. Conscious awareness enables the individual to begin to understand the factors that collectively led to the illness.

Because it has a purpose, illness can be seen as a functional condition. It may function as an agent for change. It may itself be an epiphenomenon that requires treatment, but paying heed to the "message" that is being communicated by the illness may be what finally enables healing to take place. Both scientific and popular literature often describe cases of recovery from serious illness that occurred as a result of the individual's paying attention to the message contained in the symptoms.

In clinical practice, illness communicates its messages in many ways, including symptoms arising from exposure to chemicals, rashes or breathing difficulties from consuming food allergens, neck pain from repetitive workplace activity, and stress-induced chest pains. Patients who present with these complaints are all getting messages about their bodies' interactions with their surroundings. In neurology, occurrences of hysterical blindness or hemiplegia are examples of illness as information. In both conditions, physical symptoms arising from deep psychological problems mimic severe organic disease.²⁴

In making a diagnosis, the functional medicine practitioner must be aware of the message being sent and approach the patient's illness not as an adversary to be overcome but as information that must be understood and acted upon.

Treatment decisions

The experienced practitioner of functional medicine knows that illness typically arises from multiple influences, and his or her assessment and treatment take this array of influences into account. In dealing with a problem like migraine headaches, for example, this approach contrasts with the traditional approach of Western medicine. The latter would identify the symptom pattern, rule out vascular and intracranial pathology, and test for the presence of hypertension or renal disease. Treatment would be with drugs like sumatriptan, propranolol, or ergotamine. Biofeedback might be employed as an adjunctive therapy. The functional medicine practitioner, in contrast, would ask the migraine sufferer about dietary, nutritional, genetic, environmental, lifestyle, psychosocial, or spiritual factors that might be interacting in his or her life. The practitioner would inquire into functional changes that might underlie the expression of migraine symptoms. The goal would be to develop a range of potential patient-centered solutions to migraine headache. Remediation of migraine, for example, has been reported with oral magnesium therapy (M. A. Schmidt, unpublished data), essential fatty acid supplementation (S. Baker, personal communication, 1996), removal of food, chemical, and inhalant triggers,²⁵ sublingual neutralization therapy,²⁶ spinal manipulation (P. Bolin, personal communication, 1996), acupuncture, homeopathy, and the botanical feverfew (*Tanacetum parthenium*).²⁷ The functional medicine practitioner might employ any one or a combination of these therapies, realizing that no single approach is effective with all migraine sufferers. Rea²⁵ found that the headache symptoms of 100% of a group of 30 migraine sufferers were triggered by chemicals under controlled challenge, but these were patients who reported chemical sensitivity. A patient-centered approach that recognizes statistical tendencies and diagnostic categories, but is not constrained by them, is desirable.

Another example of the value of the functional medicine approach is in assessing microbe-associated illness. The traditional approach to infectious disease regards the organism as an external threat that must be eradicated by intervention that targets that organism specifically. The microbe is the enemy, and drug therapy is the typical weapon. A broader, functional medicine approach would view the microbe as just one (albeit important) factor contributing to poor health. The functional medicine practitioner would consider the state of the host's defenses and evaluate factors that influence host defenses by examining nutritional, metabolic, environmental, lifestyle, and psychosocial factors that influence immune vigilance.

The philosophical basis of functional medicine leads to treatment decisions that are quite different from those

typically encountered in an infectious disease mode.¹ For example, a patient with Down's syndrome who suffers from recurrent infection with *S. pneumoniae* or *H. influenzae* may experience an increase in IgG₂ and IgG₄ production and a reduction in infection susceptibility with selenium supplementation.²⁸ A child with otitis media with effusion might be treated not with antimicrobials, but with elimination of allergenic foods.²⁹ An endurance runner who suffers from upper respiratory tract infection associated with heavy training might be given antioxidants.³⁰

Concept of total load

Total load refers to the sum of influences affecting an individual's life. Initially advanced by environmental medicine practitioners, the concept is now widely adopted. Included in the total load are chemicals, food, microbes, psychological stressors, and other factors, each of which alone might not give rise to the symptoms of illness. Together, however, the factors that comprise the total load may overwhelm the patient's metabolic management system. According to Rea²⁵, more than 20,000 patients at his Environmental Health Center in Dallas, Texas, experienced relief of symptoms of a range of clinical disorders through reduction of total load.

A person's biochemical individuality affects his or her susceptibility to toxins, and intervention aimed at improving function can help reduce susceptibility or sensitivity. A defective sulfur metabolism pathway, for example, might cause an individual who reacts to sulfur-rich foods to react to other substances in ways that lead to metabolic disturbance. Nutrient modulation might lessen his or her sensitivity to these environmental substances. Efforts to reduce total load should be balanced by efforts to restore function, with the long-term goal being reduced susceptibility.

Depth of action

The functional perspective requires the practitioner to examine the processes that give rise to symptoms. Arriving at a diagnosis does not guarantee that we understand what is happening or what the patient needs. For example, we might arrive at a diagnosis of "mood disorder" in a depressed patient and assume that he or she would benefit from a drug like fluoxetine. If the depression arose from a spiritual or relationship crisis, however, the drug therapy might actually interfere with the problem-solving processes that would lead to true healing. Mood and quality of life might appear to improve with drugs, but the patient's long-term healing would not have been facilitated.

A group of epileptic children who were videotaped as they interacted with their families illustrates the

point. Emotionally fraught family encounters were, in many cases, followed by seizures. When the epileptic patients were later shown films of these episodes, and they saw the relationship between emotional events and seizures, they were able, in many instances, to become almost seizure-free.³¹ Granted, drug therapy might have helped these patients to control seizures, but if drugs were the only means of intervention employed, the epileptic children would not have had the opportunity to experience healing at a deeper level.

Mechanism and outcome

Understanding biochemical mechanisms enables functional medicine practitioners to apply them in diagnosis and treatment. Understanding the mechanism of homocysteine accumulation, for example, allows them to recommend nutritional strategies like folic acid and vitamin B₁₂ therapy. By understanding fatty acid synthesis and the arachidonic acid cascade, they can develop nutritional therapies that modify inflammation. Knowing that copper accumulation leads to Wilson's disease allows them to utilize zinc therapy.

Some treatment modalities bring positive outcomes for which the mechanism is not yet well understood. Spinal manipulation in asthmatics admitted to the emergency room, for example, can lessen anxiety and ease breathing. This treatment typically brings about a 25–70% improvement in measurement of peak blood flow.³² Using pre- and post-manipulation tympanographs, Fallon showed that spinal manipulation in children with otitis media led to normalization of abnormal tympanograms (J. Fallon, personal communication, 1995). Similarly, Fryman (personal communication, 1996) has shown that cranial manipulation normalizes tympanographic measurements in some children.

The knowledge that viscerosomatic and somato-visceral reflexes influence the flow of information within the human body suggests the possible mechanism by which manipulation affects visceral function, although the mechanism is not yet clearly understood. Improved function, patient outcome, and quality of life are central to the success of any healing system, however, whether or not we understand the mechanisms of action.

Homeopathic medicine is a discipline that is not bound by mechanism, but is rooted in careful analysis and pattern recognition. Reilly³³ demonstrated that asthmatic patients who took homeopathic preparations showed significant improvement in only 1 week compared with those taking placebo. These dramatic results led him to conclude that either homeopathic medicine worked beyond a shadow of a doubt, or the double-blind, placebo-controlled trial, the gold standard of proof upon which modern pharmacology is built, was essentially invalid.

Throughout the range of healing arts and sciences,

there are numerous examples of positive treatment outcomes that occur even though the mechanism cannot be explained. In functional medicine, the value of understanding mechanisms is in improving human function and patient outcome.

Prevention, early detection, and functional medicine

"Prevention" has become a welcome and popular concept in recent years in the practice of medicine. A distinction must be made, however, between true prevention and "early detection". Although periodic mammography has been heralded as a form of preventive medicine, for example, it is clearly in the realm of early detection. Prevention assumes an understanding of factors that give rise to breast cancer and recommendation/adoption of habits or patterns that prevent disease occurrence.

Both prevention and early detection are included in the practice of functional medicine, but the patient's individuality remains paramount. Functional medicine practitioners work to prevent a specific disorder by managing risk factors, but they also strive to raise the individual's functional capacity within his or her unique life circumstances.

Approach to the patient

Functional medicine is always patient-centered, but it is not the only discipline that fits this description. Naturopathic medicine has helped to pioneer a patient-centered medical approach, not only by making the whole person the center of its practice, but also by incorporating highly patient-centered traditions into its repertoire, including traditional Chinese medicine, Ayurvedic medicine, homeopathy, chiropractic, and physical therapy, including manipulation and massage. The focus on the patient is important, however, because as methods of data management become more sophisticated, the tendency is to think in terms of probability instead of thinking in terms of the individual patient. Probability is useful in understanding the broad context of health and disease, but clinical practice is filled with so many exceptions that relying on statistics is difficult.

Laboratory and instrumental diagnosis from a functional perspective

In assessing a patient's health, the functional medicine practitioner uses tools that help in understanding how the patient functioned before developing the pathology. These tools also help the practitioner to understand function in the existence of pathology and to assist in predicting preventive measures.

Serum glucose measurement is a traditional assessment

of a fixed analyte at a fixed point in time. Although this measurement yields useful information, it does not reveal how serum glucose will respond under varying dietary conditions. The glucose challenge test, on the other hand, is a functional test that assesses glucose status over time. Similarly, although a resting ECG provides useful information, it does not indicate how the heart would respond to a physical challenge. The stress ECG shows how the heart responds upon exertion.

Assessment of magnesium is a third example. Magnesium is an intracellular element, which means that most of the body's magnesium stores are contained within cells, and only a small amount circulates in blood. A measurement of serum magnesium levels, therefore, does not reflect total body magnesium or the functional status of magnesium. Red cell magnesium is a better indicator of status, although it is a measurement of a fixed analyte at a fixed point in time and has limitations as well. Magnesium loading and subsequently assessing retention by measuring urinary excretion provide a means to assess the functional magnesium status and the unique needs of a particular patient.

For functional medicine practitioners, tools that view the body under challenge conditions give a more accurate assessment of body function. This is especially true when one wishes to examine the body's response to exogenous substances. Some individuals will experience an adverse reaction to any given drug, and these reactions are regarded as atypical and unavoidable. From a different perspective, however, the reactions are not atypical and unavoidable; they are typical and avoidable for that person, and he or she would typically be expected to have an adverse reaction on ingestion of this drug.

This understanding comes from developments in understanding the body's detoxification mechanisms. When a drug or medication is ingested, it is metabolized by the body and prepared for excretion. The process of detoxification and preparation for excretion takes place in two distinct biochemical phases, known as phase I and phase II. In the biotransformation of a drug or chemical, the agent is progressively converted to a more water-soluble, excretable substance. In phase I, which generally occurs first, a family of isozymes known as cytochrome P450 (cP450) converts the drug or substance into a reactive intermediate, which, although it may be excreted in its present form, typically is further acted upon by phase II processes.

In phase II, conjugating substances are attached to the phase I product to facilitate its excretion. Phase II reactions typically take place through glucuronidation, amino acid conjugation, glutathione conjugation, acetylation, and methylation.³⁴ The phase II process, which depends strongly on adequacy of specific nutrients, must be capable of transforming all of the phase I-generated

reactive molecules into excretable compounds. If this process is incomplete, toxic intermediates can build up.

Acetaminophen is a typical drug that undergoes conversion for excretion through these two pathways. A common OTC and prescription pain-relieving drug, acetaminophen is a useful model because more than 70,000 incidents of acetaminophen overdose were reported to US poison control centers in 1994.³⁵ Acetaminophen normally undergoes phase II transformation through the sulfation and glucuronidation pathways, with a small amount being metabolized through glutathione conjugation after conversion in phase I.³⁶ When the drug is not efficiently converted for excretion, the metabolites that build up can have negative metabolic consequences. Accumulations of one extremely toxic metabolite, NAPQI, may cause liver and nervous system damage. An individual with an adequately functioning detoxification ability that facilitates efficient phase II conversion of acetaminophen is much less likely to have a negative experience than one whose ineffective conversion pathways allow toxic intermediates to accumulate.

If one ingests acetaminophen on a regular basis, the sulfur-bearing nutrients glutathione, methionine, and cysteine can be rapidly depleted, with accompanying liver cell damage.³⁷

Adverse acetaminophen reactions may therefore result from alterations in detoxification pathways. The acetaminophen challenge test effectively assesses the function of these pathways. After the individual has consumed a challenge substance, measurements of acetaminophen metabolites in urine can determine the efficiency of the various conversion processes and provide information about the individual's unique susceptibility.

It may be that alterations in the detoxification pathways of many individuals who have "atypical" drug reactions are making them predictably susceptible to certain kinds of substances. If we can gather this information about them, we may be able to predict their response to drugs, as well as chemicals, foods, and plants. We may be able to understand the functional derangement that underlies the pathology that can result from interaction with the environment; and we may be able to use diet and nutrition to help these individuals restore function in these pathways.

Pattern recognition

The next step in the evolution of functional assessment will be to consider human physiology as a dynamic process, involving the interrelationship of multiple systems. Functional assessment of only one pathway or one series of pathways may yield useful information, but it still provides a very limited view. Functional testing will doubt soon evolve to assess multiple analytes and utilize sophisticated pattern recognition methods.

Pattern recognition is not new. For centuries, in fact, traditional Chinese medicine has dealt with "patterns of disharmony". The clinician trained in this discipline learns to recognize the pattern and assign it to a specific diagnostic category. In homeopathic medicine, it was pattern recognition that led to the extensive *materia medica*. In psychotherapy, an evaluation of the patient's life events and stories is conducted in an effort to understand the patterns that produce disharmony. In all of these examples, the mechanisms are unimportant; the pattern leads to treatment decisions.

SUMMARY

Pattern recognition, depth of action, total load, energetics, information, and patient-centered decisions all describe the early stages of development of the evolving functional approach to assessment and treatment. They also characterize a functional approach with a strong focus on the integrative use of treatment modalities based on recognition of underlying purpose in the transformations viewed by practitioners as they work with individual patients. This is also the integrative paradigm which unites naturopathy with functional medicine.

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