Alternative Therapies to Treat Cardiovascular Disease

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The purpose of this paper is to take an educational look at alternative and non-invasive therapies that are currently being used in the United States to treat cardiovascular disease. In order to accomplish this, I will first look at cardiovascular disease itself, including prevalence and problems associated with it in the United States. Next, assuming that it may be an unfamiliar field, I will inform the reader of what constitutes "alternative medicine." Finally, I will look at some of the specific alternative therapy options that are available to patients who have been diagnosed with, or want to prevent, cardiovascular disease. It is not the purpose of this paper to advocate for any one procedure over another, but to explore alternative medicine and to present the healthcare options that are available.

The very title of this paper connotates that there are other therapies available to patients of which I will not be talking about. This is certainly true. For instance, I will not be discussing the invasive surgeries such as angioplasty and bypass surgery, which are common conventional treatments for cardiovascular disease. In addition, I will not be discussing the use of drug therapies. Both surgical and drug interventions are used frequently in the United States and the average educated citizen is familiar with them. My goal is to inform the reader about alternative methods, of which many people are not familiar.

It is certainly important for the public to be educated about conventional interventions, therapeutic outcomes, and the safety risks that are involved with using them. However, it is also important that citizens have options concerning their healthcare. In fact, the United States public is increasingly turning to alternative

medicine, spending billions of dollars in healthcare fields that are often times unproven by the scientific community. These treatments are being used either in addition to or in place of conventional medicine, showing that Americans want more than one choice in healthcare, even if they have to pay out of their own pockets. That fact was a driving force behind this paper—to educate the public about healthcare options, especially in regards to a serious healthcare problem in our nation.

Cardiovascular Disease

The statistics describing the cardiovascular health of our nation are staggering. First, cardiovascular disease (CVD) is America's number one killer, responsible for more deaths than any other factor such as car accidents or cancer. In 2001, the most recent year for which statistics are available, 931,108 Americans died from all forms of CVD (New stats, 2004). In addition, although no price can be put on the value of human lives that are lost, in the year of 2003, CVD was expected to cost $210 billion in healthcare and $350 billion in lost productivity (Comarow, 2003).

Clearly, when the cardiovascular system is not functioning properly, the costs in lives and dollars are enormous. This is because the cardiovascular system has an extremely important job in the human body. The health of every single one of the trillions of cells in our bodies depends upon the health of the cardiovascular system to deliver oxygen and nutrients, and to remove wastes. What goes wrong that causes so many deaths? Let us look at some of the specific disorders affecting the cardiovascular system.

This year about 1.2 million Americans will have a first or recurrent heart attack. Of these, about half will die (New Stats, 2004). A heart attack occurs when an area of the

heart muscle does not receive the sufficient amount of oxygen that it needs, due to blockages from plaque in the coronary arteries. The result is what is scientifically known as myocardial infarction, or a heart attack. The word *infarction* actually means "cell death." Part of the heart muscle actually dies during a heart attack because of complete obstruction of blood flow in the coronary arteries—the arteries that deliver blood and oxygen to the heart muscle. (Tortora & Grabowski, 2000).

Stroke is another serious form of CVD that kills about 163,000 people in the United States each year (New Stats, 2004). A stroke occurs when a blood vessel that brings oxygen and nutrients to the brain bursts or is clogged by a blood clot or some other particle. It can result in paralysis because of the loss of blood flow that is meant to be delivered to the brain. Because of the interruption in blood flow, portions of the brain can die, which are unable to repair themselves. When brain cells die, the part of the body that is controlled by that portion of the brain is also no longer able to function.

Cardiovascular disease also goes far beyond heart attack and stroke; according to the American Heart Association, there are 64 million Americans that live with chronic, ongoing forms of CVD. If only a partial obstruction of blood flow occurs in the coronary artery, myocardial ischemia may result, rather than a full-blown heart attack. In this case, the heart muscle cells may become weakened without killing them. Additionally, ischemia may be accompanied by angina, or severe chest pain. About 6.8 million Americans suffer from angina. Some angina sufferers are prevented from being able to carry on normal day-to-day activities that most people take for granted, such as easy walking, because of debilitating chest pain (New stats, 2004, Tortora & Grabowski, 2000).

As stated above, ischemia is caused by blood flow obstruction in the coronary arteries, or the arteries that deliver blood to the heart. This is also known as coronary artery disease. Accumulation of plaques in the arteries can occur anywhere in the body, not only in the arteries of the heart. One form of this fatty buildup is called atherosclerosis, a progressive disease characterized by the formation of plaques in the walls of other arteries. Atherosclerosis is initiated by small injuries to the endothelial lining of the arterial wall. These injuries may come from high LDL cholesterol levels, prolonged high blood pressure, and carbon monoxide in cigarette smoke among other things (New stats, 2004, Tortora & Grabowski, 2000).

After one of these factors injures the inner wall of an artery, sticky platelets as well as cholesterol begin to accumulate in the inner layer of the arterial wall, called the intima-media. The contact with platelets, cholesterol, and other components of blood stimulate smooth muscle cells and collagen fibers in the arterial wall to reproduce abnormally. In response to the growth of smooth muscle cells, collagen fibers and the buildup of lipids, an atherosclerotic plaque develops, progressively obstructing blood flow as it enlarges. An accompanying danger is that the plaque may provide a roughened surface that attracts even more platelets, initiating clot formation, further obstructing blood flow. In addition, a blood clot or piece of a clot can dislodge, float through the blood stream and eventually obstruct blood flow in other vessels, causing a stroke (Tortora & Grabowski, 2000).

In addition to these diseases and problems, there are a number of risk factors that can speed their coming. About 37 million American adults have high enough cholesterol levels (240 mg/dL) to be at major risk for suffering from coronary heart disease, and

twenty-five percent of American adults have high blood pressure, a risk factor for heart attack Other controllable risk factors include smoking cigarettes and obesity. (New stats, 2004, Tortora & Grabowski, 2000).

Unfortunately, these different diseases and risk factors are often not present in isolation of each other. In actuality, one risk factor often leads to another. Patients may have high blood pressure, high cholesterol, and coronary artery disease, putting them at an extreme risk for having a major heart attack. In addition, they may be obese or smoke cigarettes; each risk factor along with an unhealthy lifestyle compounds the likelihood that the individual is in danger of suffering from one of these diseases, which account for one person dying in the United States every thirty-four seconds (Preventing Heart Disease, 2003).

Alternative Medicine

Now that I have discussed the severity of cardiovascular disease in the United States, and briefly discussed what cardiovascular diseases are and how they can develop, I will move on to looking at the current trend in the United States towards the use of alternative medicine. In a national survey completed by the New England Journal of Medicine in 1997, at least one-third of persons claimed to have used at least one alternative therapy in the past year, and one-third of those saw a provider of alternative medical therapy (Cohen, Cerone & Ruggiero, 2002). This may even be a conservative estimate. According to a study reported in Journal of the American Medical Association, as high as 40% of Americans use some form of alternative medicine. In 1997 Americans visited alternative therapy practitioners 629 million times, a 47% increase over the 427 million visits made in 1990. The data from the New England Journal of Medicine also

estimates that in 1990 the out-of-pocket cost of unconventional therapy in the United States, including the cost of herbal medicines and health food/nutrition therapy, exceeded $10 billion (Report 12, 2003).

At present, there is no definitive response answering the question of why there has been such a boom in the use of alternative medicine in our nation; however Austin (1997) proposes three theories. First, patients have become dissatisfied with conventional treatments. Reasons include ineffectiveness of conventional medicine, adverse effects, cost, and a health care system that has become too technologically oriented instead of personally oriented. Second, patients need personal control. Alternative therapies are perceived as less authoritarian, less secretive, and more empowering. Patients see conventional health care as originating from a closed community of doctors who often treat them without providing them with an understanding of the methodology, risks, and benefits of these treatments. Today's consumers want care involving some personal autonomy and control over their health care and treatment decisions. Finally, alternative therapies may seem attractive because they are seen as more compatible and consistent with patient values, such as the patient's worldview and spiritual or religious beliefs regarding the nature of health and illness.

What then is exactly "alternative medicine?" The term "alternative medicine" is subject to a wide variety of definitions. In fact, the definition will mostly likely change depending on the person who is asked. In her essay entitled *The definitional dilemma of alternative medicine*, Nienstedt lists several definitions that other authors have postulated. Eisenberg says that alternative medicine is the "Medical practices that are not in conformity with the standards of the medical community" (as cited in Gordon, Nienstedt

& Gesler, 1998, 14). In another definition, Fulder, quite broadly but not inaccurately says, "Alternative medicine…encompasses a variety of therapeutic systems which are joined by the fact that they are different from conventional medicine" (as cited in Gordon, et al, 1998, 14). Still another definition by the Harvard Medical School says that alternative medicine is "Those practices explicitly used for the purpose of medical intervention, health promotion, or disease prevention which are not routinely taught at U.S. medical schools nor routinely underwritten by third-party payers within the existing U.S. health care system" (as cited in Micozzi, 1996, 5).

All of these definitions are somewhat vague in pinpointing what "alternative medicine" is, stating that alternative medicine is, basically, anything that is not conventional medicine. These definitions are certainly broad, and rightfully so. To illustrate the point, McGuire, in her book *Ritual healing in suburban America* (1988), identified over 130 different healing groups and individuals used buy suburban residents of a single county (as cited in Gordon, et al, 1998, 16). "Alternative medicine" tends to encompass all of the treatments that are unfamiliar. However, Dana Ullman, Founder and Director of Homeopathic Educational Services, in his foreword to the book *Alternative therapies: Exploring options in health care*, states that alternative medicine is much more complex than just being something other than conventional medicine. He describes the field of alternative medicine as actually representing a completely "different paradigm" to the understanding of health and disease (as cited in Gordon, et al, 1998, xii).

However we want to define alternative medicine, most researchers and practitioners of it agree that there are indeed basic characteristics that underlie most

forms of alternative medicine. These characteristics both unite and describe what we mean when we use the words "alternative medicine," and help us to separate "alternative" from "conventional." For the purpose of this paper, I will discuss seven major characteristics of alternative medicine.

First though, as a note, I will be looking at therapies that are termed "alternative" in the United States, for some practices that Americans consider alternative have been around for thousands of years in other countries, but have only recently begun to become popular in the United States.

> For example, it would be incorrect to refer to acupuncture as "alternative" in China when you consider that most of that country's population uses it as a primary form of health care. It would also likewise seem strange to refer to homeopathic medicine as "alternative" in Europe when almost 40% of French doctors and 20% of German doctors use natural medicines in their practice, and 42% of British physicians refer patients to homeopathic doctors (as cited in Gordon, et al, 1998, xii).

The first of seven characteristics is that alternative medicine focuses on the human body's own ability to heal itself. Symptoms of disease are not necessarily bad and meant to be removed, but are the body's own defenses at work to get rid of foreign substances. For instance, a normal symptom of an infection is a rising temperature—what we call a fever. Typically, we think of a fever as something that needs to be treated with over the counter drugs or at the very least a wet washcloth across the forehead. Many alternative practitioners may find this odd when, in fact, a fever is the body's own natural immune response in order to rid the body of a foreign antigen. Another common symptom to illness is sneezing or coughing, which is the body's natural response in an attempt to remove foreign matter from the body. Alternative practitioners would be less likely to

treat these symptoms and more likely to notice that the body is merely exercising its inherent ability to ward off sickness through the immune system. Because of this trust in the body's own ability to fight disease and heal itself, most interventions involve enhancing the healing abilities that are already present within the human body.

From the strong belief that the body is capable of healing itself and that physical symptoms are not necessarily "bad," it follows that the alternative practitioner's focus is to look at the underlying issue that is causing the observed symptoms. The observable symptoms are useful for giving evidence for the underlying cause, but are not the focus of treatment. Instead, after the underlying cause has been determined, treatment interventions center on that. This seems to be congruent with the cliché that if you give a man a fish he will eat for the day, but if you teach a man how to fish he will be able to eat for a lifetime. In the same way, if merely the symptoms of the disease are treated, while ignoring the underlying problem, the patient may be taken care of for a day, a week, or whatever period of time, but if a patient is taught how to change his or her lifestyle or current patterns of living, the patient will be capable of taking care of himself or herself for their whole lifetime. For example, Vithoulkas (1979) describes the practice of homeopathy, stating that the treatment goal is not necessarily to "cure" the person, but to help them create their bodies to be a place where sickness and disease cannot exist.

This brings us to a third characteristic of alternative medicine, that the responsibility for health lays primarily with the individual and not with their practitioner. Patients must be willing to take their health into their own hands, and be responsible for how they are treating themselves on a day-to-day basis. More specifically, patients must make their own effort to be conscious of what they are putting into their body in terms of

food, drugs, cigarette smoke, drinking water, etc. Not only are patients responsible for taking care of their bodies physically, but they are also responsible for their spiritual health.

To alternative practitioners, being spiritually healthy does not necessarily mean being religious or stem from faith in a divine being. Instead, it is a focus on having healthy relationships with other people, with the environment, being content with oneself, and being genuinely satisfied with life. For instance, Lee Trivieri Jr., in his book *The American Holistic Medical Association guide to holistic health: Healing therapies for optimal wellness*, says that chronic stress has a broad suppressive effect on immune function and that repressed anger has been shown to be a contributing factor in a variety of diseases. He also states that feelings of grief, depression, hopelessness and loneliness can also greatly increase the risk of heart attack, cancer and gastrointestinal disorders (2001).

Being spiritually healthy is another way to describe the fourth characteristic of alternative medicine, which is the importance of the connection between the mind and the body. The mind is believed to have an integral role in maintaining physical health, and thus interventions may focus on the abilities of the mind. Traditionally, conventional medicine has kept the mind and the body separate, as described by the French philosopher Descartes. However, there is even an emerging field in conventional medicine, called psychoneuroimmunology, which studies how thoughts and emotions affect a person's physical health as well as how the brain and the immune system communicate with each other.

A fifth tenet of alternative medicine is a focus on the human organism to use resources that are present in nature to enhance health (Micozzi, 1996). This is especially true of the practices of homeopathy, Ayurveda, and diet therapy, which rely more on the use of herbal remedies. The idea is that humans are a part of nature, and that everything humans need to promote and maintain positive health is available to them in the environment to which they belong. Generally speaking, most alternative practitioners do not recommend using synthetic drugs, or substances that are not found in nature. This is not true of all forms of alternative medicine, with one example being chelation therapy, discussed further below, which involves using a synthetic amino acid to treat coronary artery disease and atherosclerosis.

A sixth characteristic of alternative medicine is the idea that achieving and maintaining health is very different from fighting disease (Report 12, 2003) and that good health is a positive state and not merely the absence of disease (Micozzi, 1996). Again, taking care of one's health is a daily activity that is engrained into one's lifestyle, not only thought about during an appointment to the doctor. Many alternative practitioners use the phrase "promotion of wellness" to describe their goals, again with the connotation of helping the body to function at its optimum level, not merely working just to avoid breaking down.

Finally, alternative practitioners are concerned with what works, not necessarily with what is scientifically proven. Conventional therapies tend to originate in large research oriented medical schools or from large pharmaceutical companies, where understanding of the biochemical mechanisms is engrained into the process of development. After original discovery the rest of the scientific community does not

accept the new treatment until it has passed rigorous testing using double-blind, placebo controlled studies. Dr. Isadore Rosenfeld says in his book *Dr. Rosenfeld's guide to alternative medicine* (1997) that

> Practitioners of alternative medicine aren't really concerned about theory or about the mechanisms by which something works; they're interested in results. Chinese practitioners consider it a waste of time, energy and money to do a placebo-controlled, double-blind study on an herb they are convinced works after thousands of years of use (xxii).

Alternative medicine tends to be much different than conventional medicine in this regard. The philosophy is that if it works, use it—even if it is not yet scientifically understood.

Certainly, these seven characteristics of treatment are not completely unique to alternative forms of therapy; some of these characteristics are also common to conventional medicine. For instance, conventional doctors are increasingly emphasizing lifestyle changes to their patients that would be conducive to better health. However, alternative therapies have had this emphasis for thousands of years and are more likely to put an emphasis on the characteristics that are listed here.

Alternative vs. Conventional Medicine

Now that the alternative medical view has been discussed, it may seem that the question that follows is which is better—alternative or conventional medicine? Perhaps this is an erroneous question. Instead, the better question should be: which is better for the given situation? Brian Berman, M.D., suggests that while conventional medicine is extremely effective for treating infectious diseases and traumatic injuries, it is often ill equipped to handle complex, multifaceted chronic conditions. In fact, approximately 33

million Americans are functionally limited in their daily activities because of chronic disease. One possible reason is that conventional medicine has increasingly emphasized finding a single "magic bullet" solution for each individual condition or disease it confronts. The reality is that many chronic conditions are not curable by such one-dimensional solutions (1994).

In fact, it is extremely common in the rest of the scientific community for more than one scientific model to be present in order to explain the physical world. For instance, Newtonian physics is extremely useful for solving simple acceleration, velocity, mass and gravity problems. However, Newtonian physics is at a loss and gives way to modern physics as described by Bohr, Heisenberg and others, when it comes to explaining the characteristics of electrons and quantum energy. Similarly, in chemistry, simple Lewis structures are useful for visually showing how atoms bond through the giving and sharing of electrons. In other instances, however, molecular orbital hybridization theory is needed to describe how molecules and atoms interact and bond. Neither model fits well for 100% of all circumstances. It may be no different in the scientific field of medicine. The treatment for a certain disease or condition may be best suited for either medical model—either conventional or what is currently being called "alternative." Perhaps the public is beginning to recognize this, shown by where Americans are spending billions of dollars in health care, that alternative therapies may be better suited to prevent and treat their ailments, especially the chronic and preventable conditions of CVD.

It is at this time in the paper that the therapies being utilized by alternative practitioners and patients are to be explored. This is by no means an exhaustive

description of all available alternative treatments, nor does it give all of the details regarding each therapy. If a complete description of all alternative treatments for CVD were compiled, including the complex belief systems behind some cross-cultural interventions, several thick volumes would certainly be required. Instead this paper is meant to take a look at several popular alternative choices that have either survived, failed, or have recently come under the more detailed scrutiny of the scientific method. Even though many alternative practitioners are not concerned with a scientific basis for cure, as discussed previously, for alternative methods to continue to gain acceptance by patients, doctors, and health insurance companies, scientific backing must certainly be obtained. Not only that, but objective evidence that demonstrates the effectiveness of alternative practices is essential to distinguish the difference between true medical treatments and fraudulent quackery.

I will begin with a short discussion of behavioral treatments that are agreed upon by both medical models to be effective in treating CVD. This includes lifestyle changes in diet, exercise and smoking. I will also look at the effectiveness of antioxidant and nutritional supplement therapy. Next, I will proceed to discussing cross-cultural therapies that have been around for thousands of years in Asia, and that are now gaining acceptance in the United States. Finally, I will discuss an extremely controversial therapy that has been around for about fifty years in the United States and that most people know very little about, called chelation therapy.

Behavioral Solutions

In the following section, behavioral changes in lifestyle that have been shown to significantly benefit the prevention and treatment of CVD will be explored. Again, the

following interventions are obviously not solely unique to alternative medicine, but do correspond to the kind of treatments that are initially prescribed by alternative practitioners. In addition to the effective treatments of smoking cessation, exercise and dietary changes, what the research has found regarding the efficacy of antioxidant and dietary supplements will also be discussed.

An estimated 49 million American men and women, or approximately 23% of the population put themselves at risk of heart attack by smoking cigarettes. Each day more than 4,000 people become regular smokers, and more than 2,000 of them are under age eighteen (New stats, 2004). Because of the negative relationship between smoking and CVD, these are significant statistics.

Sidney Smith, of the University of North Carolina, Chapel Hill, and chair of the committee created to update guidelines for secondary prevention of heart attack, stated, "if we could do just one thing that would be of huge benefit, it would be to reduce smoking" (as cited in Bradbury, 2001). Typically, when we think of the negative effects of smoking we think about the ill effects on the lungs. Limiting our perceptions to this one organ would be a mistake. Tobacco contains nicotine, which causes blood vessels to constrict, elevating blood pressure and reducing blood flow to the heart and other important organs in the body. Cigarette smoke also contains carbon monoxide, and hence increases free radical production which has the potential to damage the lining of the arteries (Cranton, 2001). Giving up smoking would significantly affect the cardiovascular health of our nation in a positive manner.

Just as smoking cigarettes offers a serious healthcare problem, sedentary lifestyles are also efficacious in promoting poor health. Data released by the Centers for Disease

Control and Prevention show that 60% of American adults do not achieve the recommended amount of physical activity, which is thirty minutes or more of vigorous physical activity at least three to four days per week, and that 25% of adults are not active at all. In addition, among American adults, over 65% are overweight or obese (Shalala, 1996).

For those that are overweight, systolic blood pressure can drop about one point for every two pounds of weight that is shed. In addition, aerobic exercise—about thirty minutes a day—can lower a person's blood pressure even if a pound is never lost (Liebman, 2004). Remember that one in four Americans is diagnosed as having high blood pressure, and that high blood pressure is a major risk factor for CVD.

Increasing one's level of activity is also something that just about anybody can do; it is easily accessible and affordable. However, as the foreword to the first Surgeon General's report on physical activity and health points out, our society has made it easier to become more inactive. Most Americans are spared the burden of excessive physical labor because of our dramatic increases in technology (Satcher, Lee & Joyner, 1996).

In our society, success has delineated away from how *hard* a person can work to how *smart* a person can work. Agricultural workers are able to do an enormous amount of work in less time and with less physical exertion because of technological machinery. Technology involving telephones, fax machines and the internet has allowed us to become more sedentary, giving us the freedom to accomplish all of our tasks from a single chair. As effective as this has been in helping to create a growing, affluent society, it has been equally effective in promoting the growth of our waistlines and the narrowing of our arteries.

Recommendations by the American Heart Association to become more physically active start out with simple activities that can be easily incorporated into even a busy person's life. Examples include parking further away from the grocery store in the parking lot, standing while talking on the phone rather than sitting, using the stairs instead of the elevator, taking the dog for a walk, or taking dance lessons. Although higher levels of regular physical activity are associated with lower mortality rates, even those who practice moderate amounts of activity on a regular basis have lower mortality rates than those who are least active (Physical Activity, 2004, Manly, 1996).

Not only are many Americans sadly inactive, many are also feeding themselves poor diets, the kind that have been linked to a wide variety of chronic conditions, including CVD.

The relationship between diet and optimal health has been understood by healers throughout recorded history. Hippocrates, the father of Western medicine, said 2500 years ago "Let thy food be thy medicine and thy medicine be thy food," (as cited in Trivieri, 2001). In the 12th century, famed physician Moses Maimonides echoed Hippocrates with the instruction that "no illness which can be treated by diet should be treated by any other means" (as cited in Trivieri, 2001).

The dietary changes associated with a healthier cardiovascular system includes a diet such as the DASH diet, which was developed and is promoted by the National Heart, Lung, and Blood Institute, a division of the National Institutes of Health. DASH stands for Dietary Approaches to Stop Hypertension. Recent studies using the DASH diet have shown that eating foods that are low in saturated fat, cholesterol, total fat, salt, and rich in magnesium, potassium, calcium, protein and fiber can lower a person's blood pressure

regardless of sex, age, or current blood pressure levels. The foods that are emphasized include fruits, vegetables, and low fat dairy foods as well as whole grain products, fish, poultry and nuts. The diet is reduced in red meat, sweets, sodium, and sugar-containing beverages (The Dash Eating Plan).

Recent studies also showed that blood pressure reductions came fast for those on the DASH diet—within two weeks. Detailed analysis showed that the DASH diet and reduced sodium intake reduced blood pressure for all of the population subgroups involved in a study. The following list shows the average blood pressure reduction for each of the subgroups: Those who already had hypertension dropped their blood pressure by 12/6 mm Hg (systolic/diastolic) and those without hypertension dropped 7/5 mm Hg. Women dropped 11/5 mm Hg and men dropped 7/4 mm Hg. Those over age 45 dropped 12/6mm Hg and those under 45 dropped 6/3 mm Hg. African Americans, who typically have higher levels of blood pressure than Caucasians, dropped 10/5 mm Hg while non-African Americans dropped an average of 8/4 mm Hg (NIH News Release, 2001). Remember, these decreases are from diet changes alone, not supplemented with other changes such as exercise. If these diet changes were adopted along with increases in physical activity, logically even more beneficial outcomes could be attained.

Diet Supplementation

As mentioned above, alternative practitioners stress the importance of a healthy diet in the ongoing promotion of health. However, many also teach their patients that even the healthiest diet still does not provide the optimum amount of vitamins and minerals needed keep the body functioning at its optimum level. Because of this, alternative modes of treatment may often be combined with vitamin supplementation

therapy. Alternative practitioners are not alone is this, conventional studies have also stated that antioxidant nutrients, including vitamins A, C, E, and beta-carotene, are thought to play a role in atherosclerosis. Some experts believe that mild to moderate deficiencies of these vitamins, although not severe enough to cause classic deficiency disease, may be involved in the development of CVD (Morris & Carson, 2003).

The biological basis of antioxidant use to prevent atherosclerotic CVD is based largely on the oxidative modification hypothesis of atherosclerosis (Morris & Carson, 2003). This hypothesis states that oxidative modification of LDL cholesterol is the initiator of atherosclerosis; cholesterol itself is not the problem so much as oxidized cholesterol is. Therefore, it follows that if antioxidants are capable of inhibiting the binding of oxygen to cholesterol, atherosclerosis may also be inhibited.

Let us look at some research regarding the effectiveness of using antioxidant supplements. A recently published article that performed a meta-analysis or an overview of studies that have been published in the past, found mixed results. Concisely put, for each aforementioned vitamin supplementation, vitamin A showed no decrease in risk of coronary death upon supplementation. In 3 out of 4 studies involving vitamin C, supplementation was not associated with heart disease mortality nor did it protect against coronary disease. However, one follow-up study showed that regular use of a vitamin C supplement reduced the mortality ratio for cardiovascular disease by 48% (Morris & Carson, 2003).

Supplementation with vitamin E has also given mixed results. Of seven randomly controlled trials that were reviewed, only one demonstrated a strongly beneficial effect, and this one trial had design problems. The meta-analysis study concluded that these

seven randomized trials, along with other trials testing the efficacy of vitamin E supplementation, show that cardiovascular events and mortality were not affected by vitamin E supplementation (Morris, et al). The American Heart Association, however, notes that some studies using antioxidants, especially vitamin E, both in vitro (in a test tube) and in vivo (in living organisms), have shown an association with a lower risk of coronary artery disease (Antioxidants).

When it comes to using more than one antioxidant in combination, there have been a small number of studies in the United States as well as the Europe that have shown either modest to significant reductions in either heart attack or CVD mortality. One study whose goal was to study age-related cataracts and macular degeneration also stated that antioxidant supplementation had no effect on all-cause mortality, but that participants reported chest pain much less frequently on antioxidant supplementation than without it. Supplementation with multivitamins, not only antioxidants, has also been shown in some studies to reduce coronary events, but not to significantly affect cardiovascular mortality (Morris & Carson, 2003).

Because of the mixed results, the U.S. Preventive Services Task Force, an independent panel of private-sector experts convened by the U.S. Public Health Service to evaluate clinical research, concludes that there is inadequate evidence that antioxidants can prevent CVD (Berg, 2003). In addition, the American Heart Association states that before recommending the use of antioxidants in the prevention and treatment of CVD, more well designed clinical trials must be performed (Antioxidants).

As for specific herbal supplements, there has been speculation among alternative practitioners and the makers of herbal supplements, that ingesting garlic is an effective

supplement in preventing and fighting CVD. Because of this speculation, the National Center for Complementary and Alternative Medicine, a division of the National Institutes of Health, requested a report, which was sponsored by the Agency for Healthcare Research and Quality, to look at the evidence available to either support or refute garlic's efficacy. The overall conclusion from the report was that "there are insufficient data to draw conclusions regarding garlic's effects on clinical cardiovascular outcomes" (Garlic, 2000). "Garlic preparations may have small, positive, short-term effects on cholesterol; whether effects are sustainable beyond three months is unclear." The report also indicated that there were no consistent reductions in blood pressure. Some promising effects on antithrombotic activity were reported, but few data are available for definitive conclusions, the report stated.

Despite this previous study's results, a recent two-year study of 103 men with atheroclerosis in Moscow showed that using a sustained-release garlic preparation led to a decrease in intima-media thickness of the carotid arteries, a risk factor associated with heart attack (Evans, 2003). In the double-blind study, the men involved were randomly assigned to twice-daily use of a placebo tablet or an Allicor© tablet that contained 150 mg of garlic powder. The ultrasound monitoring used showed a 44 μm average decrease with Allicor© and a 29 μm decrease with placebo. The thickness decreased in 81% of Allicor© patients and 21 % of placebo patients. Clearly, different trials involving the use of garlic have produced mixed-results and again we must conclude that more high quality studies are needed.

Maharishi Ayurveda

It is at this time that I will discuss ancient forms of Asian healthcare—Ayurveda and Acupuncture. Ayurveda is a holistic system of natural health care that originated in the ancient Vedic civilization of India. It has been around for a long time, at least since 1500 B.C., although some people say there are references to it in writings dating back to 6000 B.C. Additionally, 80% of the population in India currently receives medical care from Ayurvedic practitioners (Sharma, 1996, Rosenfeld, 1996).

The Sanskrit name "Ayurveda" is a compound of the two words *Ayus*, which means "life" or "lifespan," and *Veda*, which means "knowledge," with a connotation of completeness or wholeness of knowledge. The element of wholeness in Ayurvedic knowledge has direct clinical significance in that the Maharishi Ayurvedic clinician uses treatment approaches that deal with the full range of the patient's life—the body, mind, environment, and most importantly, the patient's consciousness (Sharma, 1996).

In Maharishi Ayurveda (MAV), the ultimate basis of disease is "losing one's connection to the innermost core of one's own being and experience" (Sharma, 1996, 243), also known as the unified field. Additionally, MAV operates under the assumption that every individual is composed of a unique blend of the three *doshas,* Pitta, Kapha and Vata. When these doshas become imbalanced disease also may result. From the beliefs in how disease originates, it follows that the primary basis of prevention and cure is restoring one's conscious connection to the unified field or re-establishing balance in the doshas. The means for promoting wellness are primarily Transcendental Meditation, manipulations of diet and the use of herbal remedies (Sharma, 1996).

For Westerners, the concept of promoting health by maintaining a connection to one's "unified field" sounds a bit strange. In an essay, Hari M. Sharma (1996) attempts to put this unfamiliarity into perspective. He first says that

> Whereas Western medicine bases its model for understanding health and disease on the *material* of the body, Maharishi Ayurveda is based on the body's *non*material, which is conceived as a field of pure intelligence. Western medicine's paradigm may seem to be seen as more scientific, but in certain respects, Ayurveda's may be seen to presage today's advanced theories of physics (244).

Sharma describes the unified field of one's consciousness, this pure intelligence, as similar to a modern physics theory, known as the quantum field theory, which suggests that at the fundamental level there is no distinction between matter and energy. Because of the capability of matter, specifically electrons, to exist as either a particle or a wave, particles themselves can be described as existing as a probability wave of energy, or "a fluctuation in an underlying, nonmaterial field (known as a force field or matter field)" (1996, 245).

> Furthermore, physicists have described all the force and matter fields that comprise the universe as modes of vibration of one underlying, unified field, sometimes called the superfield or superstring field. All the order and intelligence of the laws of nature arise from this one fundamental, nonmaterial field, as does all matter (Sharma, 1996, p. 244-245).

In the same way, MAV describes the matter of the human body as a field of intelligence or consciousness. When there are disturbances or mis-vibrations in this field of consciousness, sickness occurs. Methods of prevention of illness, and intervention in the face of disease, involve removing those disturbances and harmonizing the field

primarily through Transcendental Meditation, diet, and herbal remedies. It is at this time that I will discuss these three interventions.

Transcendental Meditation (TM) is described as a state of "restful alertness," a fourth state of consciousness distinct from the commonly experienced states of waking, dreaming and deep sleep. It involves sitting relaxed for about twenty minutes per day with one's eyes closed and silently repeating a specific, specially chosen word or phrase such as "Om," "Jesus," or a more secular word such as "one." Thoughts that come into the mind are not to be dwelt upon but should be allowed to come and go freely while the person focuses on their breathing and their specific word or phrase.

Foods also play an important role in MAV healthcare; they are thought to play a role in harmonizing, or balancing, the three doshas. Above, I mentioned that an imbalance in these, Pitta, Kapha and Vata, may cause disease. This is because each of the doshas is responsible for governing a specific function of the body. To illustrate, I will describe one of the doshas, Pitta. Pitta governs bodily functions concerned with heat and metabolism such as digestion, functions of the exocrine glands and endocrine hormones (Sharma, 1996). An imbalance in Pitta may result in a yellowish complexion, excessive body heat, heartburn, or a number of other things. It may become imbalanced from anger, strong sunshine, foods such as yogurt, linseed products or wine. Each of the other two doshas also corresponds to certain bodily functions and may be brought into balance or imbalance through the proper behaviors, foods or herbs. For instance, when Vata is imbalanced high blood pressure may result. The patient may be advised to avoid pungent and bitter foods and to increase the amount of sweet, sour and salty foods that

they consume. Additionally they may be advised to decrease the amount of fasting they do and avoid situations that induce fear and grief (Sharma, 1996).

Herbal supplementation also plays an important role in promoting health. The theory behind the use of herbal supplements and food follows directly from the belief that humans are not only material but also nonmaterial energy. In the same way, foods and herbs are also forms of energy having the power to restore balance and strengthen immunity; the body not only chews and digests the food matter, it also receives the food's energy. Just as certain foods correspond to each of the three doshas, and thus when one dosha is out of balance a certain food may need to become a greater part of a person's diet, herbs can also help balance the doshas and the body's energy.

The large degree of unfamiliarity that Westerners have with the concepts of MAV does not affect the efficacy that Ayurvedic interventions have on CVD. An article published in *Stroke*, the journal of the American Heart Association, showed in a study of sixty African American patients diagnosed with hypertension, that learning and using TM can significantly decrease a person's risk for heart attack (Castillo-Richmond & Schneider, 2000). Of the sixty patients involved, twenty-nine participated in a traditional health education group and thirty-one in a TM program. The carotid intima-media thickness, or amount of fatty buildup on each participant's arterial walls, was measured with ultrasound at the beginning of the study and after seven months.

The results showed that the TM patients experienced a decrease of 0.098 millimeters in intima-media thickness, to an increase of 0.054 millimeters for those in the traditional education group. The researchers report that a 0.1 mm decrease in intima-media thickness corresponds to an 11% decrease in risk of heart attack. The researchers

To better explain the effects of free radicals, Dr. Elmer M. Cranton, M.D., states in his book *Bypassing bypass surgery* (2001), that if left to their own devices, free radicals have the ability to wreak havoc on a person's body. By definition, a free radical is a molecule with an unpaired electron in its structure. In the body, these free radicals are generally oxygen molecules with an unpaired electron. Because molecules are only stable when all of their electrons are paired, these free radicals are extremely reactive, ready to aggressively attack any nearby substance, setting off further free radical reactions. The "nearby substances" that are often attacked are the blood vessel walls, resulting in blood vessel damage. These damaged areas then accumulate scar tissue, platelets, and cholesterol to form plaque and obstructions to the normal flow of blood (Cranton, 2001).

Despite the disagreement between these two viewpoints as to exactly how EDTA effectively clears arterial blockages, proponents of chelation therapy agree that, when used correctly by a trained physician, it can have miraculous results. The treatment procedure for administering EDTA generally involves thirty to fifty infusions intravenously of 3 grams in 500 milliliters. This turns out to be about two infusions per week for five months, with each infusion costing around $100. Infusions are generally given in a practitioner's office while the patients are allowed to sit in comfortable reclining chairs, watch TV or read a book while the solution is infused. In addition to the 3 grams of EDTA, the solutions also generally include magnesium, vitamin C, and other important vitamins (Cranton, 2001).

Dr. Cranton explains in his aforementioned book, that it takes only a very slight vascular change to significantly alter blood flow. He explains that there are thousands of

miles of arteries in the body, and that most of them are so slender that they have an opening no wider around than a human hair. These extremely thin pathways become blocked easily by plaque. However, Poiseuille's Law of Hemodynamics explains that "in the presence of turbulence, it takes something less than a 10 percent increase in diameter for a doubling of flow," (2001, 32). If EDTA chelation is able to have even a slight positive influence on removing turbulence in the arteries through the removal of plaque or making the arteries more smooth, the ability of the heart to pump blood, and the ability of the vessels to deliver nutrients and remove wastes could be greatly increased, essentially making the cardiovascular system much more efficient.

If the efficiency of the cardiovascular system were then improved, every single cell in the body would benefit. This accounts for the miraculous results that EDTA practitioners report in their case studies. Not only would the heart and arteries become healthier, but also limbs that are growing gangrenous from lack of blood flow would not need to be amputated, senility caused by a lack of blood flow to the brain could be prevented or reversed, and the other organs would function more efficiently as well. Indeed, chelating doctors say that all of these results and more have been attained, pointing to a large amount of articles published worldwide showing the efficacy of EDTA therapy, as well as the evidence in the lives of their own patients.

Still, conventional medicine is skeptical and has continued to fight against the use of EDTA chelation. Unfortunately, there has not been any large scale, double-blind studies published in the United States, the kind that conventional medicine requires in order to place it's stamp of approval upon any drug or procedure. Instead, much of the evidence for the effectiveness of EDTA therapy comes in the form of smaller-scale

studies and many individual case studies. The advocates of chelation therapy state that a primary reason that a large, double-blind study has not been performed to test the safety and efficacy of EDTA therapy is the large cost involved which no pharmaceutical company is willing to invest in. Advocates say that since the patent on EDTA has already expired (it was first discovered in the 1930's and used medically to treat heavy metal poisoning in the 1940's), any company willing to fund such a large-scale study, costing an average of $250 million dollars to meet the requirements of the Food and Drug Administration, would likely not recover in profits what it originally invested (Lazlo, 1987, as cited in Gordon, et al, 34). This is because owning the patent to a new drug or therapy gives pharmaceutical companies sole rights to produce the product, along with the freedom to charge large amounts of money for what they have created. After the patent has expired, however, any company can manufacture and sell the drug, and the price of the drug succumbs to the laws of supply and demand.

In order to find the truth regarding the safety and effectiveness of intravenous EDTA chelation therapy, or lack there of, the National Center for Complementary and Alternative medicine and the National Heart, Lung, and Blood Institute (both components of the National Institutes of Health), have launched a large, double-blind, placebo controlled study of EDTA. It began in September of 2003, is estimated to take five years, and will involved about 2,300 patients across the country. It will be about 20 times larger than any other study involving EDTA (Trial to Assess Chelation Therapy, NIH Launches). In the not-so-distant future, it sounds as though a definitive answer will be acquired regarding the safety and efficacy of EDTA chelation therapy. Considering how many Americans are affected by coronary artery disease and atherosclerosis and how

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