THE EFFICACY AND COST EFFECTIVENESS OF INTEGRATIVE MEDICINE

A Review of the Medical and Corporate Literature

A Bravewell Collaborative Report

Health & Wellbeing

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Data supporting the efficacy and cost effectiveness of an integrative approach to health care comes from three sources — medical research conducted at universities, studies carried out by corporations developing employee wellness programs, and pilot projects run by insurance companies.

The integrative approaches being studied place the patient at the center of the care and address the full range of physical, emotional, mental, social, spiritual and environmental influences that affect a person's health. Most importantly, they promote prevention by engaging the whole person in the attainment of a personalized lifestyle that supports health.

A review of the medical, corporate and payor literature reveals that, to start, immediate and significant health benefits and cost savings could be realized throughout our health care system by utilizing three integrative strategies:

- Integrative lifestyle change programs for those with chronic disease
- Integrative interventions for people experiencing depression
- Integrative preventive strategies to support wellness in all populations

INTEGRATIVE LIFESTYLE CHANGE PROGRAMS

The Centers for Disease Control and Prevention report that chronic diseases — such as heart disease, stroke, cancer, diabetes, and arthritis — are among the most common, costly, and preventable of all health problems in the U.S.

Research demonstrates that lifestyle change programs focusing on nutritional interventions, resiliency, moderate exercise, and the development of greater love, intimacy, and emotional wellbeing can mitigate and sometimes even reverse the progression of many chronic diseases, including coronary heart disease, diabetes, hypertension, obesity, and hypercholesterolemia. If widely used in primary and chronic disease care settings, millions of dollars could be saved through reduced health care utilization.

The Clinical Research

In numerous randomized controlled trials conducted over the past ten years, Dean Ornish, MD, has found that people with severe coronary heart disease were able to stop or reverse it without the use of drugs or surgery by making comprehensive lifestyle changes. The interventions used included stress management through yoga and meditation, a low-fat vegetarian diet, smoking cessation, moderate exercise, and social support. These trials were published in the *Journal of the American Medical Association*, *The Lancet*, and other major medical journals.[1]

The June 2008 *Proceedings of the National Academy of Sciences* published Ornish's more recent work in prostrate cancer, which demonstrated that lifestyle change can affect gene expression.[2] The researchers found that improved nutrition, stress management, walking, and psychosocial support changed the expression of over 500 genes

in men with early-stage prostate cancer. They also discovered that oncogenes associated with breast cancer and prostate cancer, as well as genes that cause heart disease, oxidative stress, and inflammation were downregulated or "turned off," whereas protective genes were upregulated or "turned on" by lifestyle change.

In September 2008, a related study published in *The Lancet Oncology* showed that these same integrative medicine interventions increased telomerase, the enzyme that lengthens telomeres, which are the ends of our chromosomes that control how long we live.[3] The researchers found that telomerase, and thus telomere length, increased by almost 30% in only three months, suggesting that integrative lifestyle interventions can not only reverse disease but may also extend life span.

Stress reduction is a critical aspect of lifestyle change programs. Conventional therapies, such as pharmaceutical interventions or surgeries, typically treat symptoms but do not address the causes of most chronic disease, which are often rooted in unhealthy lifestyles and high stress levels. In a related body of research, the Transcendental Meditation program, which helps individuals self-regulate the activity of physiological stress response systems, has been demonstrated to be an effective intervention for people with cardiovascular disease. Similarly, various Mindfulness Based Stress Reduction programs, which reduce distress and promote emotional regulation through increased self-awareness, have proven extremely helpful for people living with chronic diseases such as chronic fatigue syndrome, chronic pain, and cancer.

A meta-analysis of 107 studies looking at stress reduction and blood pressure concluded that the Transcendental Meditation program alone was able to reduce both systolic and diastolic high blood in a significant number of the subjects.[4] A series of NIH-funded trials demonstrated that patients participating in the Transcendental

Meditation program showed important reductions in hypertension, antheroscerosis, and insulin resistance.[5]

A meta-analysis of Mindfulness Based Stress Reduction programs involving pain, cancer, heart disease, depression, and anxiety patients demonstrated that mindfulness practice can significantly improve both health and mental health states.[6]

Cost Savings Implications

According to the American Heart Association, in 2006 1.3 million coronary angioplasty procedures were performed at an average cost of $48,399 per procedure, or more than $60 billion total; and 448,000 coronary bypass operations were performed at a cost of $99,743 per surgery, or more than $44 billion total.

The INTERHEART study, published in September 2004 in *The Lancet*, followed 30,000 men and women on six continents and found that changing lifestyle could prevent at least 90% of all heart disease.[7] Projecting forward, if only ten percent of the coronary angioplasty procedures and coronary bypass operations were avoided by utilization of lifestyle change programs, it would result in a savings of $10 billion dollars annually.

The Preventive Medicine Research Institute conducted a demonstration project in collaboration with eight hospitals to determine if comprehensive lifestyle changes could be a safe and effective alternative to bypass surgery or angioplasty. After one year, almost 80% of participants were able to safely avoid heart surgery or angioplasty, and Mutual of Omaha calculated saving almost $30,000 per patient in the first year.[8]

In a second demonstration project, Highmark BlueCross and BlueShield of Pittsburgh, Pennsylvania, partnered with hospitals in West Virginia, Pennsylvania, Illinois, and Nebraska to test the Dean Ornish Program for Reversing Heart Disease for those people with coronary artery disease. According to the 2003 BlueCross medical management report, these comprehensive lifestyle changes reduced total health care costs by 50% for those patients after only one year.

A third demonstration project of more than 2,000 patients at 22 hospital sites showed dramatic improvements in angina in more than 83% of patients.[9] With direct health care costs of angina alone running more than $1 million per person over a lifetime, a low-cost effective treatment could save millions of dollars.

As lifestyle interventions are studied in other chronic diseases, this same cost savings capacity is being duplicated. A recent diabetes study published in the *Journal of Internal Medicine* evaluated individuals at high risk for diabetes mellitus and found "lifestyle intervention to be cost effective in all age groups."[10] The cost (which included direct and non-direct medical expenses adjusted over gained quality years) was approximately $8,800 for the lifestyle intervention compared with a $29,900 cost for an oral drug (metformin) intervention.

Additionally, cost analysis studies published in *Psychosomatic Medicine* and the *American Journal of Managed Care* show that the practice of Transcendental Meditation lowered health insurance utilization, hospital inpatient days, hospital admissions and hospital outpatient visits for all categories of disease studied.[11, 12]

INTEGRATIVE INTERVENTIONS FOR PEOPLE EXPERIENCING DEPRESSION

Often overlooked and undiagnosed, depression is a costly illness in and of itself, but research indicates that patients with depression use more medical services than those who are not depressed because unresolved depression often contributes to other health disorders. If diagnosed and treated through integrative strategies, significant savings would be realized in reduced health care utilization, such as less use of pharmaceuticals and fewer mental health visits, and through a reduction in associated diseases.

The Real Cost of Depression

Conservative estimates for the cost of illness (COI) for depression are $12.4 billion per year for direct treatment costs, including doctor visits, hospitalizations, pharmaceutical costs and $4 billion per year for the consequences of not treating depression, such as loss of productivity and workplace absenteeism.[13, 14] In addition, depressed patients tend to utilize more health care services and sometimes have slower recovery rates.

A recent study published in *The Journal of Emergency Medicine* found that frequent visitors to the ER were more likely to have higher levels of stress, lower levels of social support, and worse general health status. They were also much more likely to screen positive for depression.[15] Another study of diabetes patients that was reported in *General Hospital Psychiatry* showed that patients with depressive symptoms had more hospitalizations and hospitalization days and reported missing significantly more working days as compared to non-depressed individuals.[16] A third study published in the *Journal of the American Medical Association* concluded that "depressive symptoms in older adults are associated with a significant increase in the cost of medical services."[17]

Clearly, a significant cost savings could be realized if patients were screened and treated for depression at various entry points into the health care system or through corporate health programs.

Effective Interventions from Integrative Medicine

Integrative medicine interventions for depression and stress include Mindfulness Based Stress Reduction (MBSR), Transcendental Meditation, cognitive therapy, and other mind-body therapies such as biofeedback.

In a recent literature review published in the *Journal of Psychosomatic Research*, investigators concluded that MBSR was useful as an intervention for a broad range of chronic disorders and problems. "Improvements were consistently seen across a spectrum of standardized mental health measures including psychological dimensions of quality of life scales, depression, anxiety, coping style and other affective dimensions of disability. Likewise, similar benefits were also found for health parameters of physical wellbeing such as medical symptoms, sensory pain, physical impairment, and functional quality-of-life estimates."[18]

One recent study of patients suffering from chronic-recurrent depression investigated the effectiveness of Mindfulness Based Cognitive Therapy (MBCT), a treatment combining mindfulness meditation and interventions taken from cognitive therapy. Symptoms of depression decreased from severe to mild levels in the MBCT group while there was no significant change in the control group.[19] Similarly, another study published in the *Archives of General Psychiatry* which looked at depression in older Americans concluded that, "cognitive behavioral therapy is an effective treatment for older people with depressive disorder."[20]

A 14-week multimodal group treatment program was piloted to assess whether education, lifestyle modification, meditation, and mind-body skills training would reduce symptoms and improve overall wellbeing in non-medicated patients with moderate depression. Comparisons of pre- and post-treatment scores showed a clinically significant decline in depressed mood and negative affect as well as significant improvement across the positive affect and wellbeing measures.[21]

Cost Savings Through Integrative Medicine

Cost savings through integrative approaches are achieved through two main avenues — lower utilization of expensive medical interventions such as pharmaceuticals and mental health visits and the fact that many of these interventions, such as MBSR and mind-body skills training, are taught in groups, reducing per-patient provider time.

A recent trial conducted at Allina Hospitals and Clinics in Minneapolis, Minnesota, evaluated the use of Resilience Training for reducing symptoms of depression and presenteeism (when employees are present but their illness has a negative repercussion on business performance) in hospital employees. This training focused on mind-body skills development, exercise, and nutritional approaches. More than 60% of the employees achieved remission of their depression without the aid of medications, a cost savings in and of itself. However, in addition to lowered stress and anxiety levels, the researchers also found that the Work Productivity and Activity Impairment scores suggested a presenteeism cost savings of $2,181 per employee per year.[22]

PREVENTION STRATEGIES TO SUPPORT WELLNESS IN ALL POPULATIONS

It is easier and cheaper to prevent the onset of disease than it is to treat it once a disease has developed. Nowhere is this more apparent than in corporate health care spending. Nearly 60% of all after tax profit is spent on corporate health benefits. Additionally, 80% of these costs are spent on 10% of employees.[23] Preventive measures focusing on strategies that support health and wellness, such as those found in integrative medicine lifestyle change programs, are successfully decreasing health care costs in corporations nationwide.

A review of more than 120 studies of comprehensive health management programs offered by employers as one approach to curtailing health care costs showed that in 2005 the employers experienced an average 26% reduction in health care costs and an average $5.81 returned for every $1 invested in worksite health promotion initiatives.[24] In addition to good program design and a robust engagement strategy, the best of these programs included having a strong culture of health, which includes environmental interventions such as modifications to the cafeteria and vending machine options. In addition, many corporations enhanced the physical environment to promote exercise and created quiet areas for relaxation and stress reduction.

In 2009, Drs. Milani and Lavi conducted a test in two diverse workplace settings. The interventions consisted of worksite health education, nutritional counseling, smoking cessation counseling, physical activity promotion, selected physician referral, and other health counseling. Significant improvements were demonstrated in quality of life scores, depression, and anxiety. Body fat, high-density lipoprotein cholesterol, diastolic blood pressure, health habits, and total health risk scores all improved. In addition, average employee annual claim cost decreased

48% for the 12 months after the intervention, creating a six-fold return on investment.[25]

A recent review of the long-term impact of Johnson & Johnson's health and wellness program indicated a large reduction in medical expenditures ($224.66 per employee per year) over a four-year period with fewer outpatient visits and fewer mental health visits.[26] A study assessing the impact of Highmark Inc.'s employee wellness program found that both health care expenses and inpatient expenses were reduced and that the program yielded a return on investment (ROI) of $1.65 for every $1 invested.[27]

In more targeted studies, a recent trial at the Ford Motor Company Assembly Plant which tested an integrative medicine intervention for lower back pain (acupuncture and mind-body practices for stress reduction) found a significant reduction in prescription pain medication intake, suggesting a potential long-term economic benefit to the company.[28] Another employee health program study reported in *Preventive Cardiology* looked at cardiac risk factors. The interventions included health education, smoking cessation programs, stress management, weight management, and membership in a health club, among other strategies. The researchers found that medical costs decreased for the employees in the program by $1,539 annually and that every $1 invested in worksite interventions resulted in $6 in health care savings.[29]

SUMMARY

A recent report from Mathematica Policy Research Inc., which looked at the preventive health services and evaluated their cost effectiveness, found that "Preventive services have intuitive appeal: if a disease can be detected early or prevented altogether, the cost of treating it can be reduced or eliminated. However, relatively few services have been shown to reduce lifetime total health care costs."[30] But most of the services described in this study — i.e. blood tests for cardiovascular disease; screenings for colorectal cancer, breast cancer, and diabetes; and vaccines for hepatitis B and measles — were detection efforts rather than actual preventive strategies. While these interventions do help in the early detection of disease, they are costly. The study did not, however, look at integrative medicine interventions aimed at actual prevention.

Similarly, the article also stated that, "Some interventions targeted at personal behavior (such as intensive diet counseling) may not change behavior enough to offset the costs of the intervention." One of the lessons learned in integrative medicine clinics over the past decade is that a single intervention rarely works as well as a multi-faceted approach. Care has to treat the whole person and address all the factors that influence health and disease. While integrative lifestyle change programs offer nutritional counseling, they also include stress reduction interventions, moderate exercise, mind-body training, environmental assessments and social support. It is the combined effort that produces lasting behavior change.

Based on the potential for integrative medicine to reduce costs and improve health care for patients, as evidenced in the information presented in this paper, we believe that several large, nationally-based demonstration projects comparing the cost and clinical effectiveness of integrative medicine interventions to the current standard of care would

reveal substantial benefit in three areas — integrative lifestyle change programs for those with chronic disease, integrative interventions for people experiencing depression, and integrative prevention strategies to support wellness in all populations.

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REFERENCES

1. Long-Term Effects of Lifestyle Changes on Well-Being and Cardiac Variables Among Coronary Heart Disease Patients. *Health Psychology*, Volume 27, Issue 5, September 2008, Pages 584-592.

Improvement in Medical Risk Factors and Quality of Life in Women and Men with Coronary Artery Disease in the Multicenter Lifestyle Demonstration Project. *The American Journal of Cardiology*, Volume 91, Issue 11, 1 June 2003, Pages 1316-1322.

Lifestyle changes and heart disease. *The Lancet*, Volume 336, Issue 8717, 22 September 1990, Pages 741-742.

Effects of stress management training and dietary changes in treating ischemic heart disease. *The American Journal of Cardiology*, Volume 49, Issue 4, March 1982, Page 1008.

2. Changes in prostate gene expression in men undergoing an intensive nutrition and lifestyle intervention. *Proceedings of the National Academy of Sciences*. June 2008. http://www.pnas.org/content/105/24/8369.full.
3. Increased telomerase activity and comprehensive lifestyle changes: a pilot study. *The Lancet Oncology*, Volume 9, Issue 11, November 2008, Pages 1048-1057.
4. Stress Reduction Programs in Patients with Elevated Blood Pressure: A Systematic Review and Amtea-Analysis. *Current Hypertension Reports* 2007, 9:520-528.
5. Usefulness of the Transcendental Meditation program in the treatment of patients with coronary artery disease. *American Journal of Cardiology*. 1996. 78:77-80.
6. Mindfulness-based stress reduction and health benefits. A meta-analysis. *Journal of Psychosomatic Research*. 2004 Jul;57(1):35-43.
7. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study, *The Lancet* 364 (2004), pp. 937–952.
8. The Lifestyle Heart Trial. *The Lancet*. 1990 Jul 21;336(8708):129-33.
9. Avoiding revascularization with lifestyle changes: the multi-center lifestyle demonstration project. *The American Journal of Cardiology*, Volume 82, Issue 10, Supplement 2, 26 November 1998, Pages 72-76.
10. The cost-effectiveness of lifestyle modification or metformin in preventing type 2 diabetes in adults with impaired glucose tolerance. *Annual of Internal Medicine* 2005 Mar 1:142(5):323-32.
11. Medical care utilization and the Transcendental Meditation program. *Psychosomatic Medicine* 1987.49:493-507.

12. Reduced medical care utilization and expenditures through an innovative approach. *American Journal of Managed Care* 1997. 3:135-144.
13. The cost of mood disorders. *Psychiatry*. Volume 8, Issue 2, February 2009, Pages 76-80.
14. The Economic Burden of Depression. *General Hospital Psychiatry*. Volume 8, Issue 6, November 1986, Pages 387-394.
15. A Comparison of Frequent and Infrequent Visitors to an Urban Emergency Department. *The Journal of Emergency Medicine*. Volume 38, Issue 2, February 2010, Pages 115-121.
16. Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*. Volume 57, Issue 1, July 2004, Pages 35-43.
17. Depressive Symptoms and the Cost of Health Services in HMO Patients Aged 65 Years and Older. *Journal of the American Medical Association*. Volume 277 No 20, May 28, 1997. Pages 1618-1623.
18. Comorbid Depression and Increased Health Care Utilisation in Individuals with Diabetes. *General Hospital Psychiatry*. Volume 31, Issue 3, May-June 2009, Pages 220-224.
19. Mindfulness-based cognitive therapy as a treatment for chronic depression: A preliminary study. *Behaviour Research and Therapy*. Volume 47, Issue 5, May 2009, Pages 366-373.
20. Clinical effectiveness of individual cognitive behavioral therapy for depressed older people in primary care: a randomized controlled trial. *Archives of General Psychiatry*. 2009 Dec; 66(12):1332-40.
21. Multimodal Mind/Body Group Therapy for Chronic Depression: A Pilot Study EXPLORE: *The Journal of Science and Healing*, Volume 5, Issue 6, November-December 2009, Pages 330-337.
22. Private Communication April 24, 2010. Dr. Jeffrey Dusek, Research Director, The Penny George Institute for Health and Healing at Allina Hospitals.
23. Impact of a Worksite Wellness Intervention on Cardiac Risk Factors and One-Year Health Care Costs. *The American Journal of Cardiology*, Volume 104, Issue 10, 15 November 2009, Pages 1389-1392.
24. Do Employee Health Management Programs Work? *American Journal of Health Promotion*. 2009 Mar-Apr; 23(4):1-8, iii.
25. Impact of Worksite Wellness Intervention on Cardiac Risk Factors and One-Year Health Care Costs. *Preventive Cardiology*. Volume 104, Issue 10, 15 November 2009, Pages 1389-1392.
26. Long-term impact of Johnson & John son's Health And Wellness Program on Health Care Utilization and Expenditures. *Journal of Occupational and Environmental Medicine*. Volume 44, Number 1, January 2002. Pages 21-29.
27. The Impact of the Highmark Employee Wellness Programs on 4-Year Health Costs. *Journal of Occupational and Environmental Medicine*. Volume 50, Number 2, February 2008. Pages 146-56.
28. An Integrative Medicine Intervention in a Ford Motor Company Assembly Plant. *Journal of Occupational and Environmental Medicine*. Volume 52, Number 3, March 2010. Pages 256-257.
29. Impact of a Worksite Wellness Intervention on Cardiac Risk Factors and One-Year Health Care Costs. *The American Journal of Cardiology*, Volume 104, Issue 10, 15 November 2009, Pages 1389-1392.
30. Encouraging Appropriate Use of Preventive Health Services. *Issue Brief*. May 2010, Number 2. http://www.mathematicampr.com/publications/PDFs/Health/Reformhealthcare_IB2.pdf accessed May 2, 2010.