

A CLINICALLY PROVEN TECHNIQUE TO REDUCE CARDIOVASCULAR DISEASE AND ITS RISK FACTORS

Scientific evidence of the clinical efficacy
and cost effectiveness of the
Transcendental Meditation® program

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NONPHARMACOLOGIC TREATMENT OF CARDIOVASCULAR DISEASE

The Transcendental Meditation technique in the treatment of hypertension and coronary heart disease

EXECUTIVE SUMMARY

Recent clinical trials, other controlled studies, and meta-analyses (of all relevant studies) have identified a new non-drug treatment that leads to improved medical outcomes for patients with cardiovascular disease including hypertension and coronary heart disease.

This treatment, the Transcendental Meditation program, is widely acceptable, cost effective, and free of harmful side effects. We propose that the Transcendental Meditation program be actively utilized (1.) as a first-line or adjunctive non-drug therapy in high blood pressure—hypertension (HTN) and (2.) in the adjunctive treatment of coronary heart disease (CHD).

We recommend that insurance companies and other third-party payers provide reimbursement for Transcendental Meditation instruction for:

1. treatment of hypertension—either as sole therapy or adjunctive to other conventional therapies
2. treatment of coronary heart disease—as part of a multifaceted program including other forms of lifestyle modification and drug therapy as indicated.

The scientific rationale for the effectiveness of the Transcendental Meditation program for these conditions is based on two premises: (i) the well-established principle that stress causes, contributes to and/or exacerbates cardiovascular diseases such as hypertension and coronary heart disease, and (ii) a large body of evidence showing that the Transcendental Meditation technique is the most effective stress-reduction technique available for cardiovascular disease patients. Extensive scientific research has shown reductions in high blood pressure, hardening of the arteries, enlarged heart size, insulin resistance, anxiety, smoking, alcohol use and mortality.

Reducing stress, which means reducing abnormalities in the body that are the result of overload, naturally reduces the physiological and pathological consequences of chronic stress.

There are yet other reasons for insurance companies to cover this intervention. Several cost-benefit analyses indicate lower hospitalization rates, lower outpatient utilization rates and longitudinal reductions in health care costs for those who regularly practice this particular meditation technique.

Further, there are simultaneous improvements in health and quality of life in patients across a wide range of stress-related disorders.

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BACKGROUND

Prevalence and burden of hypertension and coronary heart disease

Health care costs continue to spiral upward, in large part due to the increasing prevalence of chronic diseases, notably cardiovascular disease. About 30% of the adult population in developed nations has hypertension. In the US, about 15 million adults have been diagnosed with CHD, and nearly 50% will die as a result of cardiovascular disease (CHD or stroke). Thus, cardiovascular disease is the number one cause of premature death and serious disability in the US and other developed nations, as well as worldwide.

Conventional therapies

More than \$300 billion is spent each year in the US on the diagnosis and treatment of cardiovascular disease. Conventional therapies encompass a wide variety of drugs including diuretics, beta blockers, ACE inhibitors, angiotensin II receptor blockers, calcium channel blockers, alpha receptor blockers, vasodilators, statins, nitrates, resins, fibrates, niacin, thrombolytics, aspirin and hormone replacement therapy. Surgical procedures include angioplasty

and coronary artery bypass graft surgery.

Inadequacies of conventional therapy

Conventional drug therapies do not address the causes of cardiovascular disease, which are often rooted in unhealthy lifestyle behaviors. Furthermore, conventional pharmacological and surgical therapies for cardiovascular disease often lead to serious adverse effects, including adverse drug effects, impairments in quality of life, and increased mortality.

For these reasons, national practice guidelines of the American Heart Association, the American College of Cardiology, the National Institutes of Health (NIH) and other professional associations recommend non-drug lifestyle modifications (i) as the first line of therapy for individuals with hypertension and (ii) as part of a comprehensive package of lifestyle modifications and drug therapy for individuals with diagnoses of CHD.

This latter group includes patients who have had a myocardial infarction, coronary artery procedures to open clogged arteries (revascularization), chronic angina or stroke.

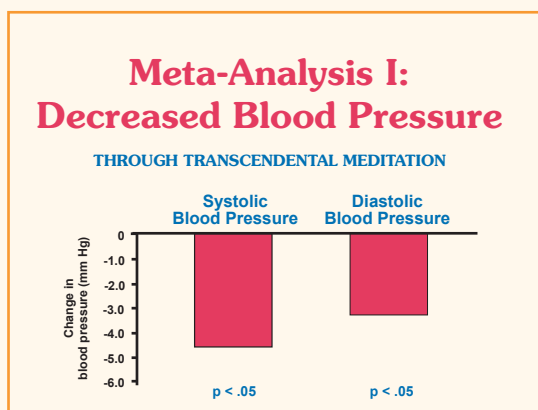


Figure 1: Decreased Blood Pressure

This study was a meta-analysis examining the effect of all published randomized, controlled clinical trials on the effects of the Transcendental Meditation program on blood pressure, comprising nine studies with 711 subjects. The Transcendental Meditation program was found to have a statistically significant impact of reducing both systolic and diastolic blood pressure. Reference: *American Journal of Hypertension* 21: 310–316, 2008.

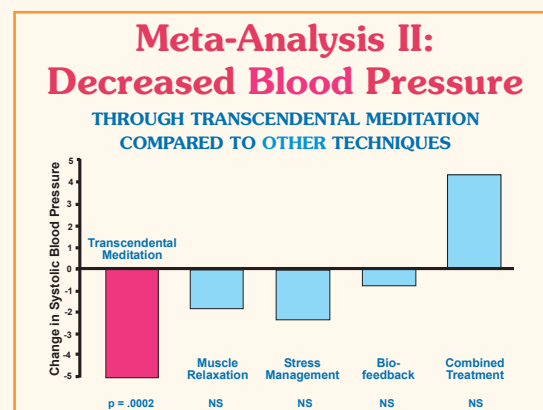


Figure 2: Decreased Blood Pressure Compared to Other Techniques

This meta-analysis of 107 published studies on stress reduction and blood pressure found that only the Transcendental Meditation program had a statistically significant impact of reducing high blood pressure among hypertensive subjects. Reference: *Current Hypertension Reports* 9: 520–528, 2007.

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In contrast, the Transcendental Meditation program, introduced to the world 50 years ago by Maharishi Mahesh Yogi, targets a basic, contributing cause of cardiovascular disease, the lifestyle factor we call 'stress'. Many research studies document the stress-reducing and health-promoting effects of the Transcendental Meditation program, and there have been no documented adverse effects associated with the use of the program to reduce stress, treat cardiovascular disease, or with its use by the general population for disease prevention and health promotion.

Data supporting the effectiveness of the Transcendental Meditation program in treating cardiovascular disease

a. Hypertension: Randomized clinical trials and other controlled studies show that the Transcendental Meditation program reduces blood pressure in persons with hypertension [1-4]. End organ damage associated with hypertensive heart disease is also reduced.

Dr. J. Anderson and colleagues of the University of Kentucky Medical Center [5] conducted a systematic review and meta-analysis to assess the effects of the Transcendental Meditation program on BP,

incorporating objective quality assessments of the research literature. They reviewed the published literature through December 2006. The meta-study evaluated all randomized controlled trials that compared BP responses between a group practicing the Transcendental Meditation technique and a control group.

Primary outcome measures were changes in systolic and diastolic BP. A specific rating system (0–20 points) was used to evaluate the quality of studies and appropriate statistical procedures (random effects models) were used for the meta-analysis. The meta-analysis indicated that the Transcendental Meditation program, compared to control, was associated with the following statistically significant changes: –4.7 mm Hg in systolic BP and –3.2 mm Hg in diastolic BP (FIGURE 1). When the analyses were limited just to hypertensive groups or just to the highest-quality studies, similar reductions in BP were found.

The authors concluded that: (a) the Transcendental Meditation program significantly reduces high blood pressure; (b) it reduces SBP by ~5 mm Hg and DBP by ~3 mm Hg; and, (c) sustained BP reductions of this magnitude are likely to signifi-

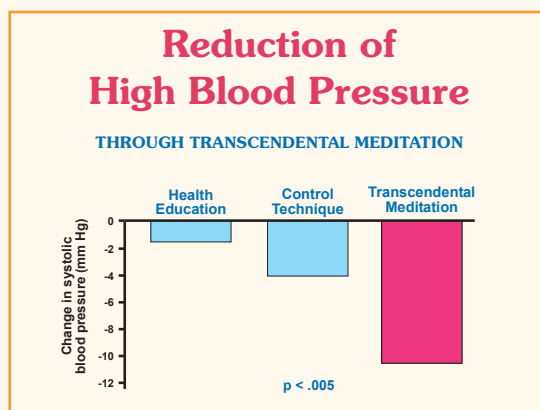


Figure 3: Reduction of High Blood Pressure

Patients with high blood pressure who learned the Transcendental Meditation program showed a significant reduction of systolic and diastolic blood pressure after three months, in contrast to those randomly assigned to a control technique or to those who received education on how to reduce blood pressure through diet and exercise. Reference: *Hypertension* 26: 820–827, 1995.

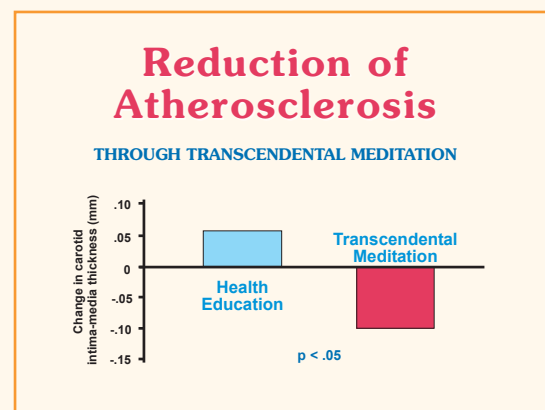


Figure 4: Reduction of Atherosclerosis

Patients with coronary artery disease who learned the Transcendental Meditation program showed significantly reduced carotid artery wall thickness after 9 months, a surrogate measure of reduced atherosclerotic plaque, compared to health education controls who learned how to reduce their risk of heart disease through proper diet and exercise. Reference: *Stroke*, 2000 Mar, 31(3):568-73.

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cantly reduce risk for serious cardiovascular disease, that is heart attacks and strokes

Nearly simultaneously, a systematic review and meta-analysis of all the published literature on stress reduction and relaxation methods for high blood pressure was conducted by Rainforth et al. [6] (FIGURE 2). These authors critiqued previous meta-analyses of stress reduction, other relaxation methods and high blood pressure and concluded that most were outdated and/or methodologically limited.

They, therefore, conducted an updated systematic review of the published literature and identified 107 studies on stress reduction and BP. Seventeen trials (with 23 treatment comparisons and 960 participants with elevated BP) met criteria for a well-designed, randomized controlled trial.

Meta-analysis was used to calculate BP changes (SBP/DBP) for biofeedback, -0.8/-2.0 mm Hg (P = not significant [NS]); relaxation-assisted biofeedback, +4.3/+2.4 mm Hg (P = NS); progressive muscle relaxation, -1.9/-1.4 mm Hg (P = NS); stress management training, -2.3/-1.3 mm (P = NS); and the Transcendental Meditation program,

-5.0 / -2.8 mm Hg (P = 0.002/0.02).

They concluded that simple biofeedback, relaxation-assisted biofeedback, progressive muscle relaxation and stress management training did not elicit statistically significant reductions in elevated BP while the Transcendental Meditation technique did.

They also concluded that the Transcendental Meditation program should be recommended to patients with elevated BP for preventing or treating hypertension and other forms of cardiovascular disease.

Available evidence thus indicates that: (i) among stress reduction approaches, only the Transcendental Meditation program is associated with statistically significant reductions in BP and (ii) Transcendental Meditation causes reductions in other risk factors for cardiovascular disease and improvements in clinical cardiovascular disease-related outcomes.

b. Coronary Heart Disease: A series of NIH-sponsored clinical trials found that high-risk patients who were randomly assigned to the Tran-

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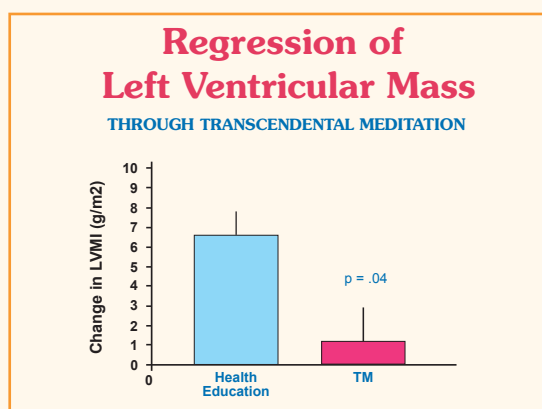


Figure 5: Prevention of Left Ventricular Hypertrophy

Patients with hypertensive heart disease who learned the Transcendental Meditation program did not show significantly elevated left ventricular mass after 7 months compared to health education controls who learned how to reduce their risk of hypertensive heart disease through proper diet and exercise. Reference: *Ethnicity and Disease*, 2004. 14: S2-54.

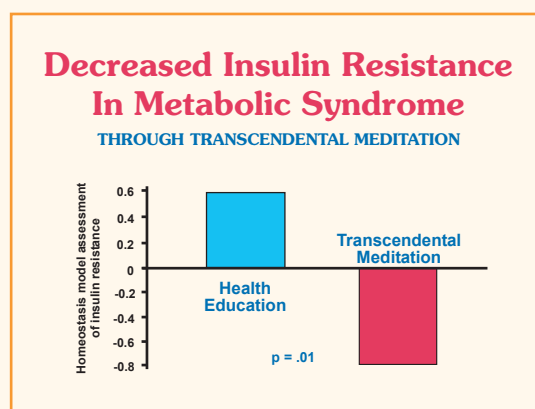


Figure 6: Decreased Insulin Resistance of Metabolic Syndrome in Heart Disease Patients

This randomized controlled clinical trial among individuals with stable cardiac heart disease found that 16 weeks of practice of the Transcendental Meditation program, in contrast to participation in a health education program, led to a significant reduction in insulin resistance, which is considered the basis of metabolic syndrome that often leads to diabetes and heart disease. Reference: *Archives of Internal Medicine* 166: 1218-1224, 2006.

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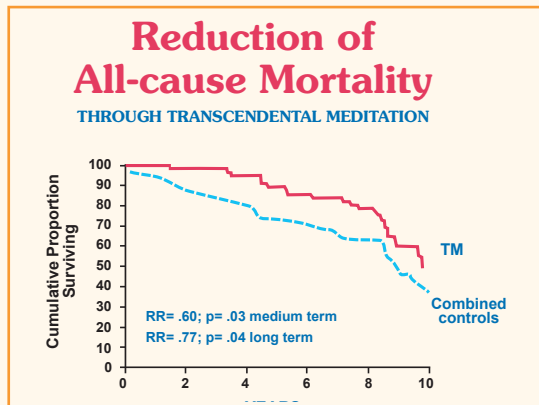


Figure 7: Long-Term Effects of Transcendental Meditation on All-Cause Mortality

Elderly patients (average age 72 years) with high blood pressure who learned the Transcendental Meditation program showed significantly lower all-cause mortality rates including cardiovascular over a 10 year period compared to combined controls (health education, mindfulness, generic relaxation and usual care). Reference: *American Journal of Cardiology*, 2005. 95(9): 1060-1064.

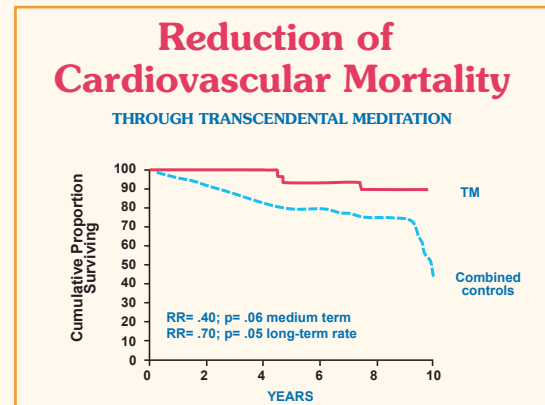


Figure 8: Reduction of Cardiovascular Mortality

This study followed the mortality pattern an average of 8 years after elderly individuals with high blood pressure learned the Transcendental Meditation technique or participated in control interventions. The results showed a 30% decrease in the rate of cardiovascular mortality among those who learned the Transcendental Meditation technique. Reference: *American Journal of Cardiology* 95:1060-1064, 2005

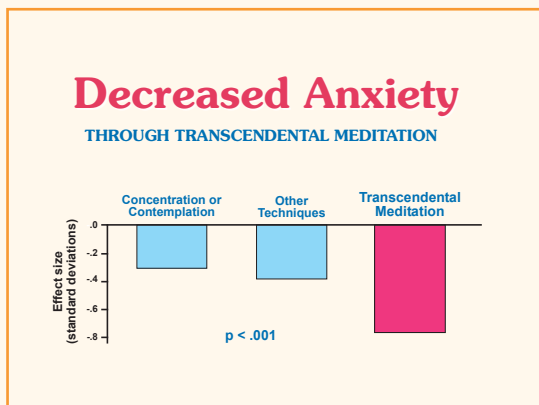


Figure 9: Effectiveness in Reducing Trait Anxiety

A meta-analysis of 146 studies comparing the effectiveness of different mental and physical relaxation techniques including biofeedback on reducing trait anxiety showed that the Transcendental Meditation technique was most effective by a statistically significant margin. Reference: *Journal of Clinical Psychology*, 1989. 45(6): 957-974.

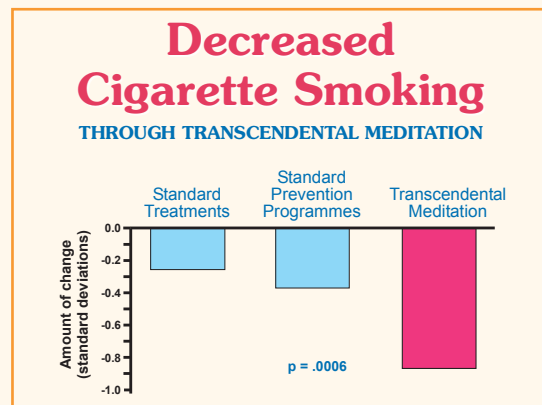


Figure 10: Decreased Cigarette Smoking

A meta-analysis of all research studies on the Transcendental Meditation program related to cigarette smoking, in comparison to meta-analyses of standard treatment and prevention programmes for smoking, found a significantly greater reduction of cigarette use among those who learn the Transcendental Meditation program, even though this programme does not involve any guidance about change in lifestyle or habits. Reference: *Alcoholism Treatment Quarterly* 11: 13-87, 1994.

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scendental Meditation program showed reductions in risk factors for CHD including hypertension [1,2] (FIGURE 3), clogging of the arteries (atherosclerosis) [7,8] (FIGURE 4), the size of the heart's left ventricle [9] (FIGURE 5) and resistance to the effects of insulin [10] (FIGURE 6). Another trial showed that the Transcendental Meditation program increases exercise tolerance in coronary heart disease patients [11].

The long-term effects of the Transcendental Meditation program were also assessed by evaluating its effects on all-cause mortality and cardiovascular mortality (FIGURES 7-8). This analysis was done for older subjects who had high blood pressure and who had participated in randomized controlled trials that included the Transcendental Meditation program and other behavioral interventions [12]. The Transcendental Meditation program increased survival (that is, decreased mortality). A statistical analysis showed 23% reduction in the mortality rate from all causes.

Additional analyses showed that after an average of 7.6 years, there was a 30% decrease, in the rate of cardiovascular disease-related mortality (rela-

tive risk = 0.70) in the Transcendental Meditation group (compared to combined controls).

c. Psychosocial Stress: In a meta-analysis of the effects of stress reduction and relaxation techniques on anxiety, the most commonly studied form of psychosocial stress, Dr. K. Eppley of Stanford University and his colleagues separately estimated and compared the effects of the main classes of mind-body techniques: stress reduction, relaxation, and the Transcendental Meditation program (FIGURE 9).

They reported that the Transcendental Meditation technique reduced anxiety to a significantly greater extent than other clinically devised forms of relaxation or stylized rest. These differences were found even after adjustment for experimental design, duration of treatment, expectancy of benefits, and experimenter attitude [14,16].

This meta-analysis has been critically reviewed [17,18]. Other published meta-analyses have reported that the Transcendental Meditation technique reduced other risk factors for CHD, including sympathetic nervous system arousal [13], smoking [16] (FIGURE 10), and alcohol consumption [16] (FIGURE 11).

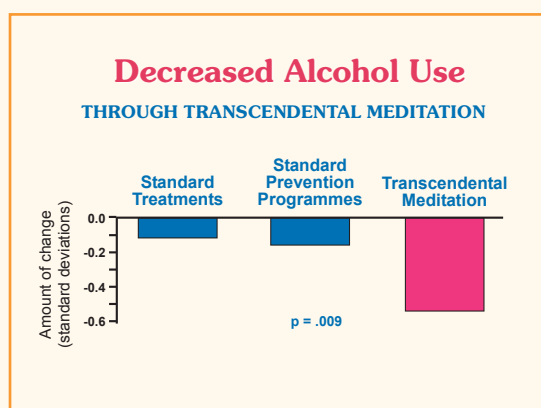


Figure 11: Decreased Alcohol Use

A meta-analysis of all research studies on the Transcendental Meditation program related to alcohol use, in comparison to meta-analyses of standard alcohol treatment and prevention programmes, found a significantly greater reduction of alcohol use among those who learn the Transcendental Meditation program, even though this programme does not involve any guidance about change in lifestyle or habits. Reference: *Alcoholism Treatment Quarterly* 11: 13-87, 1994.

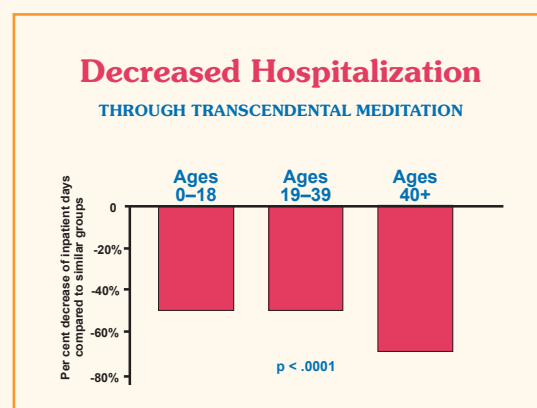


Figure 12: Decreased Hospitalization Indicating Healthier Ageing

An analysis of five years of medical insurance data found that the significant reduction in hospitalization among participants in the Transcendental Meditation program, in comparison to other insured persons, was even more dramatic among participants who were older. Reference: *Psychosomatic Medicine* 49: 493-507, 1987.

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Decreased Outpatient Visits

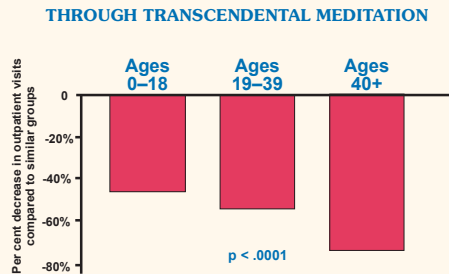


Figure 13: Decreased Outpatient Visits Indicating Healthier Ageing

Participants in the Transcendental Meditation program, in contrast to the average of all other insured persons, showed a significant reduction in outpatient doctor visits that was even more pronounced among participants who were older, as indicated by analysis of five years of medical insurance data. Reference: *Psychosomatic Medicine* 49: 493–507, 1987.

Decreased Medical Expenses

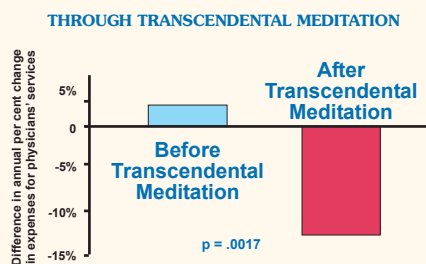


Figure 14: Decreased Medical Expenses

This study measured annual percentage change in government payments for physicians' services over 14 years among 1,418 people in Quebec, Canada, who learned the Transcendental Meditation program in comparison to randomly-selected controls. After learning the Transcendental Meditation program, individuals showed an average annual decline of 13.8 per cent in payments. Reference: *American Journal of Health Promotion* 14: 284–291, 2000.

WHAT IS THE TRANSCENDENTAL MEDITATION PROGRAM?

The Transcendental Meditation program has its origin in the ancient Vedic tradition [19,20]. Maharishi Mahesh Yogi restored the Vedic knowledge for the full scientific value of its theory and practice [21]. The Transcendental Meditation technique does not use concentration or contemplation; it is not a philosophy or religion. It is a simple, natural yet precise mental technique, practiced twice daily for 15 or 20 minutes each session, while sitting comfortably in a chair with eyes closed. The practice produces a unique state of restful alertness.

The Transcendental Meditation technique has been taught worldwide since 1957. Over 6 million people worldwide have learned the Transcendental Meditation technique, 2 million people in the United States. Hundreds of published scientific research studies document its benefits [22].

HOW DOES THE TRANSCENDENTAL MEDITATION TECHNIQUE WORK?

Basic and clinical research indicates that practice of the Transcendental Meditation technique ameliorates hypertension and cardiovascular disease by reducing stress. This in turn reduces the chronic activation of physiological stress response systems, especially ones that affect the cardiovascular system.

One of these is the sympathetic nervous system (SNS), which causes fight or flight response to the heart and blood vessels. Another is the hypothalamic pituitary-adrenal (HPA) axis [23, 24] which allows psychosocial stress to drive up blood levels of stress hormones such as cortisol.

As the chronic effects of stress on mind and body are reduced by regular practice of the Transcendental Meditation technique, risk factors for CHD are reduced. As shown above, these include: (1) cardiovascular reactivity [25-27]; (2) anxiety [14]; (3) hypertension [1,2,6,15]; (4) insulin resistance (considered the basis of metabolic syndrome) [10]; (5) smoking [16]; (6) alcohol abuse [16]; and (7) surrogate and intermediate endpoints for CHD such as (a) myocardial ischemia [11], (b) carotid artery wall

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thickness [7-8], and (c) left ventricular enlargement (hypertrophy) [7,9,11,29].

This integrated series of effects leads to a reduction in clinical CHD-related events, including premature mortality [12].

It is suggested that the Transcendental Meditation program reduces cardiovascular disease and its risk factors because it enables the individual to achieve a unique state of restful alertness, which allows the body's endogenous homeostatic and self repair mechanisms to become restored and reactivated.

When this happens, blood pressure and other key factors revert back to their original, healthier set points. In other words, the Transcendental Meditation technique may be thought of as a technique to enliven the body's own inner intelligence [19]. These findings are completely in accord with the widely accepted biobehavioral model of cardiovascular disease [23,24].

INSTRUCTION AND FOLLOW-UP

The Transcendental Meditation technique is taught by certified instructors in a standardized way everywhere in the world, through a systematic program of instruction. The Transcendental Meditation course gives the individual the experience and knowledge needed to correctly practice the Transcendental Meditation technique on their own, and gain the maximum benefits.

The course consists of seven meetings with the professional instructor, with 90 minutes per meeting. These seven meetings consist of:

1. Introductory lecture (in a group) describing the benefits.
2. Preparatory lecture (in a group) describing how the technique works
3. A brief personal interview with the instructor.
4. Personal instruction in the Transcendental Meditation technique.
- 5-7. Group meetings based on the individuals' experiences of practicing Transcendental Meditation.

Individuals often notice immediate benefits of their practice of the Transcendental Meditation technique during these first days of instruction. A

regular follow-up program is offered to confirm the correctness of practice.

COST/BENEFIT CONSIDERATIONS

Using the Transcendental Meditation program is demonstrably cost-effective. The individual fee for the Transcendental Meditation course in the USA is \$2,000 which includes a life time follow-up program.

This is highly cost-effective in light of the documented benefits: Studies [30-34] show that regular practice of the Transcendental Meditation technique lowers health insurance utilization rates with significantly fewer hospital inpatient days and outpatient visits, and fewer inpatient admissions for all major categories of disease (FIGURES 12-14). Across all disease categories, there was a 56% lower utilization rate. For the two key physiological systems relevant to this proposal, reductions were even greater: 87% reductions for both cardiovascular disease and for diseases of the nervous system. A Canadian study [32-33] showed a longitudinal reduction (a cumulative savings of 13% per year) in government payments to physicians.

CONCLUSION

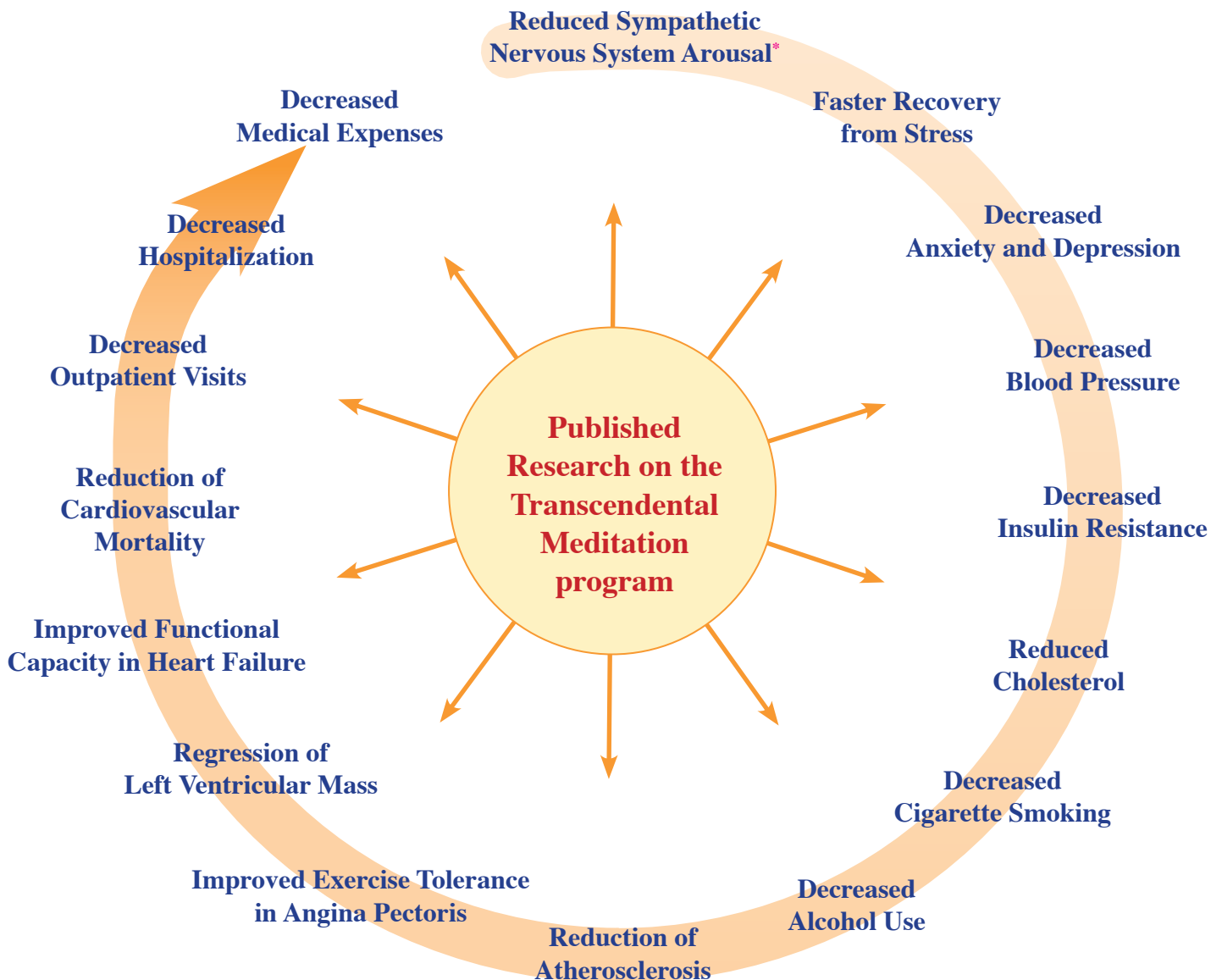
A cumulative body of well designed clinical trials, other clinical studies, and meta-analyses demonstrates that a nonpharmacologic approach, the Transcendental Meditation program—for the treatment of hypertension, coronary heart disease and their risk factors is effective in the sole or adjunctive care of cardiovascular disease. Furthermore, there are no harmful side effects from this technique. Additional benefits include improved quality of life and reduction or elimination of other chronic stress-related conditions.

These clinical effects are clearly cost-effective. Based on the published biomedical evidence, it is proposed that payment of the cost of Transcendental Meditation instruction by insurance companies and third-party payers is justified and timely.

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Major Cardiovascular Disease Factors Reduced by One Natural and Effective Procedure, Free From Side-Effects



Improved Clinical Outcome and Reduced Need for Pharmacological and Surgical Treatments

Thousands of physicians worldwide recommend the practice of the Transcendental Meditation program to their patients

* The indicated sequence is a simplified version of complex and parallel physiological interactions

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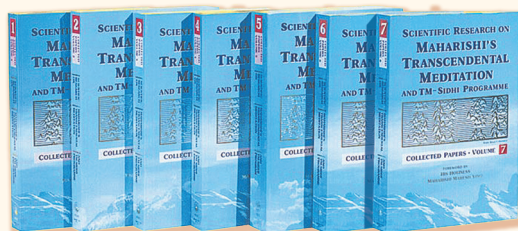
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Extensive Scientific Research Verifies the Effectiveness of the Transcendental Meditation Program



The practical benefits of the Transcendental Meditation program have been verified by more than 600 scientific research studies conducted at over 250 independent universities and research institutes in 33 countries. Scientific research on the Transcendental Meditation program has been collected in seven volumes, 6,000 pages.

AHA Scientific Statement

**Beyond Medications and Diet: Alternative Approaches
to Lowering Blood Pressure**

A Scientific Statement From the American Heart Association

Robert D. Brook, MD, Chair; Lawrence J. Appel, MD, MPH, FAHA, Co-Chair;
Melvyn Rubenfire, MD, FAHA; Gbenga Ogedegbe, MD, MPH; John D. Bisognano, MD, PhD; Wil-
liam J. Elliott, MD, PhD, FAHA; Flavio D. Fuchs, MD, PhD; Joel W. Hughes, PhD; Daniel T. Lack-
land, DrPH, MSPH, FAHA; Beth A. Staffileno, PhD, FAHA;
Raymond R. Townsend, MD, FAHA; Sanjay Rajagopalan, MD; on behalf of the American Heart As-
sociation Professional Education Committee of the Council for High Blood Pressure Research, Council
on Cardiovascular and Stroke Nursing, Council on Epidemiology and Prevention, and Council on Nutri-
tion, Physical Activity and Metabolism

Hypertension. published online April 22, 2013

The online version of this article, along with updated information and services, is located at: [http://hyper.ahajournals.org/
content/early/2013/04/22/HYP.0b013e318293645f](http://hyper.ahajournals.org/content/early/2013/04/22/HYP.0b013e318293645f)

Brook RD et al., Beyond Medications and Diet: Alternative Approaches to Lowering Blood Pressure. A Scientific Statement from the American Heart Association. Hypertension, 61:00, 2013.

Highlights from the Scientific Statement:

According to the American Heart Association, the Transcendental Meditation technique is the only meditation practice that has been shown to lower blood pressure. According to the AHA, “Because of many negative studies or mixed results and a paucity of available trials, all other meditation techniques (including MBSR) received a ‘Class III, no benefit, Level of Evidence C’ recommendation. Thus, other meditation techniques are not recommended in clinical practice to lower BP at this time.”

The AHA scientific statement also reported the finding that lower blood pressure through Transcendental Meditation practice is associated with substantially reduced rates of death, heart attack and stroke.

The AHA scientific statement concludes that alternative treatments that include the Transcendental Meditation technique are recommended for consideration in treatment plans for all individuals with blood pressure > 120/80 mm Hg.

The report also recognized that Transcendental Meditation is generally considered safe and without harmful side effects. As an additional advantage, the statement noted that many of the reviewed alternative therapies, such as meditation, may provide a range of health or psychological benefits beyond BP lowering or cardiovascular risk reduction.

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TIME
Health & Family

Strongest Study Yet Shows Meditation Can Lower Risk of Heart Attack and Stroke

By Laura Blue Nov. 14, 2012

Most doctors say meditation can't hurt you, but now there's reassuring evidence that it may help you as well when it comes to warding off disease.

Previous studies have linked better health outcomes among heart patients who practiced meditation compared to those who did not, but none of those trials could definitively credit the brain-focusing program with the better health results. In the latest trial to address those limitations, however, meditation does appear to have an effect on reducing heart attack, stroke and even early death from heart disease, at least among African-Americans...

Current Hypertension Reviews, 2012, Vol. 8, No. 3.



Prevention and Treatment of Cardiovascular Disease in Adolescents and Adults through the Transcendental Meditation® Program: A Research Review Update

Vernon A. Barnes¹, and David W. Orme-Johnson²

¹Georgia Prevention Center, HS1640, Georgia Health Sciences University, Augusta, GA 30912, USA; ²191 Dalton Drive, Seagrove Beach, FL 32459 USA

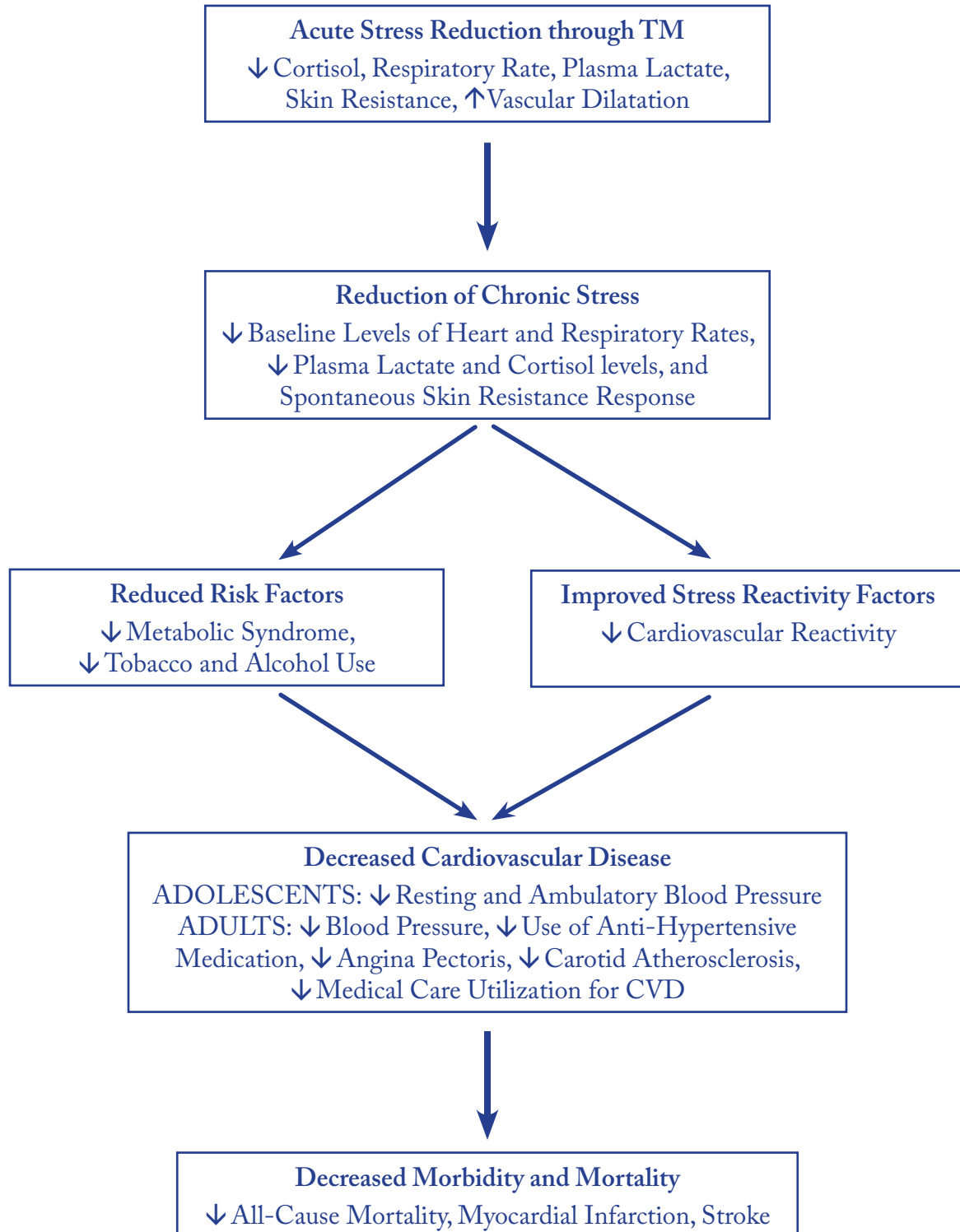
Abstract: The pathogenesis and progression of cardiovascular diseases are thought to be exacerbated by stress. Basic research indicates that the Transcendental Meditation® technique produces acute and longitudinal reductions in sympathetic tone and stress reactivity. In adolescents at risk for hypertension, the technique has been found to reduce resting and ambulatory blood pressure, left ventricular mass, cardiovascular reactivity, and to improve school behavior. Research on adults with mild or moderate essential hypertension has reported decreased blood pressure and reduced use of anti-hypertensive medication. The technique has also been reported to decrease symptoms of angina pectoris and carotid atherosclerosis, to reduce cardiovascular risk factors, including alcohol and tobacco use, to markedly reduce medical care utilization for cardiovascular diseases, and to significantly decrease cardiovascular and all-cause morbidity and mortality. These findings have important implications for inclusion of the Transcendental Meditation program in efforts to prevent and treat cardiovascular diseases and their clinical consequences.

Treatment and prevention of CVD through stress reduction (see figure next page). A model of the Transcendental Meditation® (TM) program's effects on hypertension and CVD as reviewed in this paper is presented. Chronic environmental and psychosocial stresses, and genetic predisposition, contribute to an increase in acute stress-induced sympathetic nervous system (SNS) arousal, resulting in increased neurohormonal activity and hypothalamic-pituitary-adrenocortical axis dysregulation. Such changes result in greater blood pressure (BP) responsivity to the stress, vasoconstriction and increased BP levels. Reduction of acute and chronic stress via TM practice reduces SNS activity resulting in reduced BP reactivity to acute stress. Over time, due to decreased CV reactivity to acute events, there is reduced load upon the heart, resulting in decreased BP levels, thereby helping to prevent essential hypertension (EH) and CVD.

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Treatment and Prevention of Cardiovascular Disease (CVD) Through Stress Reduction



This model (credit Vernon A. Barnes) shows how regular practice of the Transcendental Meditation Program may reduce chronic stress, which in turn reduces CVD risk factors and improves stress reactivity, thereby decreasing cardiovascular disease, and consequential morbidity and mortality.

Circulation: Cardiovascular Quality and Outcomes



Circulation: Cardiovascular Quality and Outcomes. 2012; 5: 750-758

Published online before print November 13, 2012, doi: 10.1161/CIRCOUTCOMES.112.967406

Original Article

Stress Reduction in the Secondary Prevention of Cardiovascular Disease

Randomized, Controlled Trial of Transcendental Meditation and Health Education in Blacks

Robert H. Schneider, MD, FACC, Clarence E. Grim, MD, Maxwell V. Rainforth, PhD, Theodore Kotchen, MD, Sanford I. Nidich, EdD, Carolyn Gaylord-King, PhD, John W. Salerno, PhD, Jane Morley Kotchen, MD, MPH and Charles N. Alexander, PhD†

Abstract

Background—Blacks have disproportionately high rates of cardiovascular disease. Psychosocial stress may contribute to this disparity. Previous trials on stress reduction with the Transcendental Meditation (TM) program have reported improvements in cardiovascular disease risk factors, surrogate end points, and mortality in blacks and other populations.

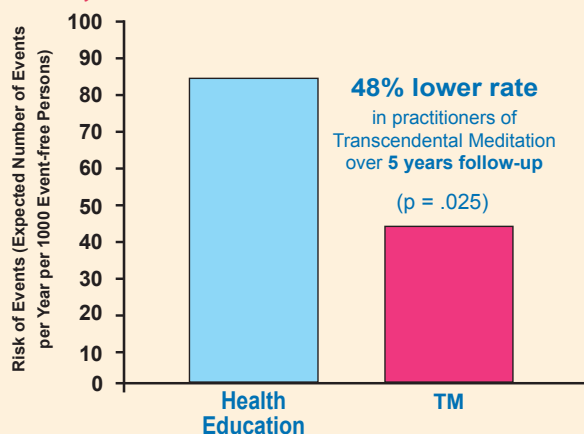
Methods and Results—This was a randomized, controlled trial of 201 black men and women with coronary heart disease who were randomized to the TM program or health education. The primary end point was the composite of all-cause mortality, myocardial infarction, or stroke. Secondary end points included the composite of cardiovascular mortality, revascularizations, and cardiovascular hospitalizations; blood pressure; psychosocial stress factors; and lifestyle behaviors. During an average follow-up of 5.4 years, there was a 48% risk reduction in the primary end point in the TM group (hazard ratio, 0.52; 95% confidence interval, 0.29–0.92; $P=0.025$). The TM group also showed a 24% risk reduction in the secondary end point (hazard ratio, 0.76; 95% confidence interval, 0.51–1.13; $P=0.17$). There were reductions of 4.9

mmHg in systolic blood pressure (95% confidence interval –8.3 to –1.5 mmHg; $P=0.01$) and anger expression ($P<0.05$ for all scales). Adherence was associated with survival.

Conclusions—A selected mind–body intervention, the TM program, significantly reduced risk for mortality, myocardial infarction, and stroke in coronary heart disease patients. These changes were associated with lower blood pressure and psychosocial stress factors. Therefore, this practice may be clinically useful in the secondary prevention of cardiovascular disease.

EFFECTS OF TRANSCENDENTAL MEDITATION PROGRAM ON

Death, Heart Attack and Stroke



Schneider RH, Grim CE, Rainforth MV, et al. Stress reduction in the secondary prevention of cardiovascular disease: randomized controlled trial of Transcendental Meditation and health education in Blacks. *Circulation: Cardiovascular Quality and Outcomes*. 5:750-758, 2012

The Transcendental Meditation technique: *A clinically proven natural technique for reducing hypertension and heart disease*



Page last updated at 00:18 GMT, Tuesday, 17 November 2009

Meditation 'eases heart disease'

Heart disease patients who practise Transcendental Meditation have reduced death rates, US researchers have said.

At a meeting of the American Heart Association they said they had randomly assigned 201 African Americans to meditate or to make lifestyle changes.

After nine years, the meditation group had a 47% reduction in deaths, heart attacks and strokes.

The research was carried out by the Medical College of Wisconsin with the Maharishi University in Iowa.

It was funded by a £2.3m grant from the National Institute of Health and the National Heart, Lung and Blood Institute.



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EMBARGOED PRESS RELEASE
Wednesday, November 18, 2009

Contact: Ken Chawkin
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At-Risk College Students Reduce High Blood Pressure, Anxiety, And Depression Through Transcendental Meditation

The Transcendental Meditation® technique may be an effective method to reduce blood pressure, anxiety, depression, and anger among at-risk college students, according to a new study to be published in the [*American Journal of Hypertension*](#), December 2009.

“[The Transcendental Meditation Program](#), a widely-used standardized program to reduce stress, showed significant decreases in blood pressure and improved mental health in young adults at risk for hypertension,” said David Haaga, PhD, co-author of the study and professor of psychology at American University in Washington, D.C.

This study was conducted at American University with 298 university students randomly allocated to either the Transcendental Meditation technique or wait-list control over a three-month intervention period. A subgroup of 159 subjects at risk for hypertension was analyzed separately. At baseline and after three months, blood pressure, psychological distress, and coping ability were assessed.

For the students at risk for developing hypertension, significant improvements were observed in blood pressure, psychological distress and coping. Compared to the control group, students practicing the Transcendental Meditation program showed reductions of 6.3 mm Hg in systolic blood pressure and 4.0 mm Hg in diastolic blood pressure. These clinically significant reductions are associated with a 52% lower risk for development of hypertension in later years.

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MEDIA EXCERPTS
from more than a thousand press reports

The New York Times

Tuesday, June 13, 2006

Vital Signs

Regimens: High Blood Pressure? Meditation May Help

By Nicholas Bakalar

Transcendental Meditation improves blood pressure and insulin resistance in heart patients, according to a placebo-controlled study carried out at an academic medical center in California.



Health

Monday, March 17, 2008

Meditation Lowers Blood Pressure

Doc: Other Relaxation Techniques Don't Work As Well

Transcendental Meditation helps lower blood pressure without the side effects that can come from medication, according to a new study.

The Washington Post

HEALTH

Monday, May 2, 2005

Transcendental Meditation
Stress-reducing relaxation may improve life expectancy

The Transcendental Meditation technique:
A clinically proven natural technique for reducing hypertension and heart disease



Meditation benefits patients with heart disease

Blood pressure, insulin resistance improved, even without weight loss

(June 13, 2006) In a study of adults with coronary heart disease who were stable and were receiving optimal medical care, 16 weeks of transcendental meditation not only led to significant reductions in blood pressure, but also improved heart rate variability and insulin resistance, which is associated with an increase risk of diabetes.



NEWS RELEASE

MARCH 12, 2007

Penn Study Shows Transcendental Meditation Can Help Combat Congestive Heart Failure

Results of NIH-Funded Study Published in the Journal Ethnicity & Disease



Science and Your Health

A guide to some of the newest research and recommendations

Meditation and Medication

Stress-reduction techniques such as meditation may help reduce high blood pressure and the need for treatment, according to a study published in the American Journal of Hypertension last week.

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