The contents of this bibliography do not provide medical advice and should not be so interpreted. Before beginning any exercise program, see your physician for clearance.
NOTE: Abstracts for many of the research articles cited in this bibliography are available online via PubMed (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi). Studies cited in relation to specific disorders and venues, e.g., hypertension, the workplace, etc., only include explicitly stress-related articles and do not reflect the full range of extant resources on these topics, which are covered in separate bibliographies.

**ABC Relaxation Training.** Roosevelt University Stress Institute. URL: http://www.roosevelt.edu/academics/cas/sp/stressinstitute.htm.

“ABC Relaxation Training integrates the major recognized approaches to professional self-relaxation: progressive muscle relaxation, yoga, breathing exercises, imagery, and eight forms of meditation.”


Abstract: Describes guided fantasy, yoga and autogenic phrases and thermal feedback as approaches to helping children manage stress. Provides guidelines for the use of these methods, followed by descriptions of each approach.


**Antistress yoga.** Available online: http://www.yogamedicine.com/Antistressyoga.htm.


_________. The Transcendental Meditation program for the reduction of stress-related conditions. *Journal of Chronic Disease and Therapy Research,* 1979, 3(9):11–21.

Auriol, Bernard M. Yoga et relaxation. URL: http://auriol.free.fr/Yoga.htm. [In French.]

Numerous studies cited by Dr. Auriol.


OBJECTIVE: This study examined the impact of the Transcendental Meditation (TM) program on cardiovascular (CV) reactivity in adolescents with high normal BP. METHOD: Thirty-five adolescents [34 African Americans (AAs), 1 Caucasian American (CA); ages 15-18 years] with resting systolic blood pressure (SBP) between the 85th and 95th percentile for their age and gender on three consecutive occasions, were randomly assigned to either TM (n=17) or health education control (CTL, n=18) groups. The TM group engaged in 15-min meditation twice each day for 2 months including sessions during school lunch break. Primary CV outcome measures were changes in blood pressure (BP), heart rate (HR), and cardiac output (CO) at rest and in response to two laboratory stressors, a simulated car driving stressor and an interpersonal social stressor interview. RESULTS: The TM group exhibited greater decreases in resting SBP (P<.03) from pre- to post-intervention, compared to the CTL group. The TM group exhibited greater decreases from pre- to post-intervention in SBP, HR, and CO reactivity (P's<.03) to the simulated car driving stressor, and in SBP reactivity (P<.03) to the social stressor interview. CONCLUSION: The TM program appears to have a beneficial impact upon CV functioning at rest and during acute laboratory stress in adolescents at-risk for hypertension.


On the author’s first meditation class, recommended to her because of her stress level.

**Bellarosa, C., and P. Y. Chen.** The effectiveness and practicality of occupational stress management interventions: A survey of subject matter expert opinions. *Journal of Occupational Health Psychology*, Jul 1997, 2(3):247–262. (Relaxation was found to be the most practical and meditation the least practical of six interventions.)


The following review of this study appears in an article by Ralph La Forge entitled “Spotlight on Yoga” in the May 2001 issue of *IDEA Health and Fitness Source* (http://www.findarticles.com/cf_0/m0BTW/5_19/74886169/p1/article.jhtml?term=yoga):

Study: Researchers at the Scientific Research Department at Kaivalyadhama S.M.Y.M. Samiti in Lonavla, India, compared the efficacy of Shavasana (a yogic relaxation posture) and two other postures (resting in a chair and resting in the supine position) as methods of recovery from induced physiological stress (treadmill running).

Twenty-one males and six females (age range = 21-30 years) were allowed to rest in one of the above postures after completing a treadmill workout. Recovery was assessed by measuring resting and exercise recovery heart rate and blood pressure. These factors were measured before and every two minutes after the treadmill running until they returned to their initial resting levels. The results revealed that the effects of treadmill exercise stress were reversed in significantly (p < 0.01) shorter time with Shavasana than with either of the other two resting postures.

Comments: The Shavasana pose (sometimes spelled “Savasana” or called “corpse pose”) is often overlooked as an effective yoga pose. Seemingly easy, it is one of the most challenging poses in yoga. Shavasana is practiced in a relaxed supine position, feet apart, palms facing up to gently open the chest. The neck should be extended. (Placing a folded towel underneath the neck is recommended.) What primarily distinguishes Shavasana from the other two modes of relaxation used in this study is utilization of the breath. Abdominal yogic breathing is sequenced with normal breathing throughout Shavasana.


Abstract: Stress is said to be part of life, but stress may be uniquely experienced by different groups of women. We conducted this study to compare the experiences of stress and the methods of stress management used by lesbian and heterosexual women. A convenience sample of 215 (136 lesbian and 79 heterosexual) urban women was used. All women reported generally good mental health; however, more than 80% of the women reported moderate or severe stress. There were more similarities than differences between the groups, but lesbians reported more stress due to sexual identity, being female, and mental problems, and heterosexual women reported more stress due to parents and children. Both groups used a wide range of stress management strategies, although lesbians more frequently used meditation and therapy.


This meditation “balances and repairs the sympathetic nervous system . . . It gives resistance to tension and high pressure environments.”


This meditation is “a direct healer for the kidneys and adrenal glands. Consequently it helps repair the energy drained by long term stress.”

___________. Adrenal gland imbalance; Tension; Tranquilizer. In Alice Clagett and Elandra Kirsten Meredith, eds., *Yoga for Health and Healing: From the Teachings of Yogi Bhajan*. Santa Monica, Calif.: Alice B. Clagett, 1994, p. 51; 97; 99.

Bhamgara, M. M. How to relax. *Yoga and Life*, no. 5, p. 11.


OBJECTIVE: Mindfulness-Based Stress Reduction (MBSR) is a clinical program, developed to facilitate adaptation to medical illness, which provides systematic training in mindfulness meditation as a self-regulatory approach to stress reduction and emotion management. There has been widespread and growing use of this approach within medical settings in the last 20 years, and many claims have been made regarding its efficacy. This article will provide a critical evaluation of the available state of knowledge regarding MBSR and suggestions for future
research. METHODS: A review of the current literature available within the medical and social sciences was undertaken to provide an evaluation regarding what we know about the construct of mindfulness, the effectiveness of MBSR, and mechanisms of action. RESULTS: There has been a paucity of research and what has been published has been rife with methodological problems. At present, we know very little about the effectiveness of this approach. However, there is some evidence that suggests that it may hold some promise. CONCLUSIONS: The available evidence does not support a strong endorsement of this approach at present. However, serious investigation is warranted and strongly recommended.


Findings: Improved immune response to stress.


Breathing away tension with yoga. Consumer Reports, Feb 2000, p. 44. (Part of a set of articles on stress relief.)


Candlelight Yoga: Soothing Yoga for Stress Relief and Relaxation DVD. Crunch Workout. Anchor Bay Entertainment.


Abstract: With the dual aims of better understanding the contribution of Yoga to positive mental health and exploring links between yogic philosophy and psychological theory, researchers at Deakin University in Melbourne, Australia, conducted a study on Yoga as a preventative and treatment for symptoms of mental illness. The Yoga classes were designed as a six-week program incorporating breathing techniques (*prânâyâma*), exercises for strength, vitality, and flexibility (*âsanas*), guided relaxation (*yoga-nidrâ*), and meditation. The aim of this process was to enhance self-awareness, encourage the perspective that emotional states are somewhat transient, and encourage a self-accepting and calm attitude through concentrating on synchronizing gentle movements and breathing. By developing calmness, self-acceptance, a balanced perspective, and enhanced concentration it was hypothesized that participants in the six-week Yoga program would strengthen their resistance to emotional distress. Psychometric testing was carried out to assess symptoms of stress, anxiety, and depression across three groups: regular Yoga practitioners, beginners entering the program, and people who did not practice Yoga, and these tests were re-administered after six weeks. In addition, a strong sense of intrinsic spiritual experience has been cited as a possible buffer to stress, anxiety, and depression and has been associated with decreased frequency of medical symptoms. All participants were therefore also assessed on their sense of intrinsic spirituality, but not on religious beliefs. At the end of six weeks, the Yoga beginners group showed lower average levels of symptoms of depression, anxiety, and stress than at commencement, but levels were stable for regular Yoga practitioners and people who did not practice Yoga. In addition, beginners showed growth in their self-reported level of intrinsic spiritual experience.


Abstract: The purpose of this program of research was to explore the use of muscle stretching procedures in relaxation training with a clinical population. In the first controlled study, stretching exercises for four muscle groups (obicularis occuli, sternocleidomastoid/trapezius, triceps/pectoralis major, and forearm/wrist flexors) were prepared. A group of people using these procedures (SR, N = 8) was compared to a group using the Bernstein and Borkovec (1973) tense-release (TR; N = 8) techniques for those same muscle groups, as well as compared to an appropriate group of controls (WL; N = 8). Assessment of physiological (multi-site EMG) and subjective (emotions, muscle tension, and self-efficacy) responses showed that persons in the SR displayed less sadness, less self-reported muscle tension at four sites, and less EMG activity on the r.masseter than persons in the TR group. In the second study, 15 subjects were administered
an expanded version of the SR relaxation procedures. Results showed that all subjects reported significant decreases in self-reported levels of muscle tension; muscle tension responders showed lowered trapezius EMG and respiration rates and cardiovascular responders showed lowered diastolic blood pressure. The results are discussed in terms of the utility of relaxation procedures based primarily on muscle stretching exercises for lowering subjective and objective states of arousal.


Abstract: The goals of this work were to assess the effects of participation in a mindfulness meditation-based stress reduction program on mood disturbance and symptoms of stress in cancer outpatients immediately after and 6 months after program completion. A convenience sample of eligible cancer patients were enrolled after they had given informed consent. All patients completed the Profile of Mood States (POMS) and Symptoms of Stress Inventory (SOSI) both before and after the intervention and 6 months later. The intervention consisted of a mindfulness meditation group lasting 1.5 h each week for 7 weeks, plus daily home meditation practice. A total of 89 patients, average age 51, provided pre-intervention data. Eighty patients provided post-intervention data, and 54 completed the 6-month follow-up. The participants were heterogeneous with respect to type and stage of cancer. Patients’ scores decreased significantly from before to after the intervention on the POMS and SOSI total scores and most subscales, indicating less mood disturbance and fewer symptoms of stress, and these improvements were maintained at the 6-month follow-up. More advanced stages of cancer were associated with less initial mood disturbance, while more home practice and higher initial POMS scores predicted improvements on the POMS between the pre- and post-intervention scores. Female gender and more education were associated with higher initial SOSI scores, and improvements on the SOSI were predicted by more education and greater initial mood disturbance. This program was effective in decreasing mood disturbance and stress symptoms for up to 6 months in both male and female patients with a wide variety of cancer diagnoses, stages of illness, and educational background, and with disparate ages.


Abstract: The efficacy of meditation-relaxation techniques has been widely researched in the laboratory, but their effectiveness for management of stress in organizational settings is still relatively unexplored. The present study compared relaxation and control conditions as part of a program of stress-reduction in industry. A total of 154 New York Telephone employees self-selected for stress learned one of three techniques—clinically standardized meditation (CSM), respiratory one method meditation (ROM) or progressive relaxation (PMR)—or served as waiting list controls. At 5.5 months, the treatment groups showed clinical improvement in self-reported symptoms of stress, but only the meditation groups (not the PMR group) showed significantly more symptom reduction than the controls. The meditation groups had a 78% compliance rate at 5.5 months with treatment effect seen whether subjects practiced their techniques frequently or
occasionally. The safe and inexpensive semi-automated meditation training has considerable value for stress-management programs in organizational settings.

Email: amparo@mum.edu. MEDLINE® PMID: 0010700487.

BACKGROUND AND PURPOSE: African Americans suffer disproportionately higher cardiovascular disease mortality rates than do whites. Psychosocial stress influences the development and progression of atherosclerosis. Carotid intima-media thickness (IMT) is a valid surrogate measure for coronary atherosclerosis, is a predictor of coronary outcomes and stroke, and is associated with psychosocial stress factors. Stress reduction with the Transcendental Meditation (TM) program decreases coronary heart disease risk factors and cardiovascular mortality in African Americans. B-mode ultrasound is useful for the noninvasive evaluation of carotid atherosclerosis. METHODS: This randomized controlled clinical trial evaluated the effects of the TM program on carotid IMT in hypertensive African American men and women, aged >20 years, over a 6- to 9-month period. From the initially enrolled 138 volunteers, 60 subjects completed pretest and posttest carotid IMT data. The assigned interventions were either the TM program or a health education group. By use of B-mode ultrasound, mean maximum IMT from 6 carotid segments was used to determine pretest and posttest IMT values. Regression analysis and ANCOVA were performed. RESULTS: Age and pretest IMT were found to be predictors of posttest IMT values and were used as covariates. The TM group showed a significant decrease of -0.098 mm (95% CI -0.198 to 0.003 mm) compared with an increase of 0.054 mm (95% CI -0.05 to 0.158 mm) in the control group (P=0.038, 2-tailed).
CONCLUSIONS: Stress reduction with the TM program is associated with reduced carotid atherosclerosis compared with health education in hypertensive African Americans. Further research with this stress-reduction technique is warranted to confirm these preliminary findings.

Castleman, Michael. Making the grade: San Francisco yoga teacher Tony Sanchez is teaching inner city students an important life skill—stress management. *Yoga Journal*, Dec 2002, pp. 91-95.


Written by a cardiologist who developed a stress management program for heart patients that is generally applicable. The program includes meditation, and the book cites supporting research.


__________. How yoga helps reduce anxiety and manage stress. URL:http://www.americanyogaassociation.org/Onesheets/02anxiety.html.


“Yoga poses and breathing techniques can be used by all Ohio State students to reduce exam-related stress. Serene Tree. Energized Warrior. Pliant Cobra. These are all poses used in residence halls, apartments and yoga classes around campus to help relieve stress.

“Maryanna Klatt, assistant professor of family medicine, said yoga can help students unwind during stressful times such as exam week

“‘Yoga can be a proactive approach to doing your best on finals,’ Klatt said.

“Klatt also said that yoga can be done at anytime by anyone.

“‘The best time to do yoga is in the morning before starting your day, (but) yoga stretches can even be done from your chair as you study for exams,’ Klatt said . . .”


**Cushman, Anne.** Relax and recharge: Yoga for total fitness. *New Woman*, Apr 1993, pp. 113-115.


**Deason, Suzanne.** *Stress Release Yoga for Beginners* video. Living Yoga, 1998. 30 minutes.

__________. *Stress Relief Yoga* DVD. Living Arts, 2004. 65 minutes.

From a review at Amazon.com: “The actual practice is only 20 minutes. The cover notes say there is a total of 1 hour and 5 minutes of content, [but the] rest is an interview with Suzanne Deason and a ‘how to’ section for using yoga props.”

**Deeken, Aimee.** More people turn to yoga to reduce stress. *Daily Texan* (University of Texas at Austin), 26 Jan 2000.


On the stressful lives most children lead and how to change this.


Evening Stress Release for Beginners video. Yoga Zone. 40 minutes.


“Long Island Journal column: YMCA recreation center in East Hampton opens yoga classes to help local children release stress.”

Flex away stress: Yoga booms with new generation. *Florida Today*, 14 May 1998, Final/All, 21(37), Health & Fitness section. (On Yoga class sponsored by Public Service Electric & Gas Co., Newark, New Jersey.)


“Twenty years ago, Fran Palumbo was seeing three doctors and two therapists for the almost unbearable pain in her back caused by a non-cancerous lump. One night, she started weeping uncontrollably. And then, dreamlike, her whole life flashed in front of her eyes.

‘I realized I had the worst disease of all. The disease of attitude,’ says the Fairfield, Conn., resident. ‘That was my moment of truth. I started to pray for wisdom.’ Those prayers led her to meditation, a practice she has done daily since 1985.

“Back then, she was like every other suburban mother, running between tasks: driving car pools, attending PTA and Cub Scout meetings, helping her husband with his business.

“‘Two weeks meditating, the lump went away,’” she said. ‘I began to see things with fresh eyes. I never realized the sky was so blue. And please don't think I’m crazy, but I can taste the clouds in a glass of water.’ Palumbo’s only regret is that she didn’t discover meditation years before. ‘It is the most powerful gift you can give yourself.’”

“Yoga, the art of stretching and meditation, has seen an explosion in popularity recently,” Lane said.

“People are looking for a balance in [their] life,” Lane said. ‘Yoga gives that mind-body connection.’”


“It took me until middle age to learn how to relax. I’ve spent most of my life being uptight, driven to excel at whatever I pursued and being ruled by the clock. I couldn’t stand to be idle . . . Then out of curiosity last winter, I took a yoga class. It seemed long and tedious, not enough
action for me. I found the deep breathing and relaxation part of the class particularly difficult. But I kept going, knowing that was what I needed most . . . In the last 10 minutes of class, we do deep relaxation. I used to think, ‘Okay, I can skip this and slip out a few minutes early.’ I fought the instinct. And then one time, after 10 weeks, I actually nodded off. That's when I realized I can do this. I can really make myself relax . . .”

**Georges, Cedri Domian.** Relaxation and Realization: From the standpoint of one who has attained neither! *Yoga Life*, Mar 1998, 29(3):8–12.


Abstract: This study is an attempt to rigorously map the psychological effects of Zen meditation among experienced practitioners. Fifty-nine Zen meditators with at least six years of experience practiced an hour of traditional Zazen seated meditation. A control group of 24 college students spent 60 min silently reading popular magazines. Before relaxation, all participants took the Smith Relaxation States Inventory (SRSI), the Smith Relaxation Dispositions/Motivations Inventory (SRD/MI), and the Smith Relaxation Beliefs Inventory (SRBI). After practice, participants again took the SRSI. Analyses revealed that meditators are less likely to believe in God, more likely to believe in Inner Wisdom, and more likely to display the relaxation dispositions Mental Quiet, Mental Relaxation, and Timeless/Boundless/Infinite. Pre- and post-session analyses revealed that meditators showed greater increments in the relaxation states Mental Quiet, Love and Thankfulness, and Prayerfulness, as well as reduced Worry. Results support Smith’s ABC Relaxation Theory.

**Gillespie, Peggy R.** Beyond relaxation: A comprehensive guide to the latest stress reduction techniques—and an exciting new model for understanding and uprooting the causes of stress. *Yoga Journal*, Jul/Aug 1988, pp. 36–43, 118–119. (Compares several relaxation techniques, including Hatha-Yoga.)


“No created with The Yoga Biomedical Trust, Relieve Stress will show you ways to relax and focus with quiet, paced yoga techniques that relieve anxiety and help you respond effectively to the ups and downs of everyday life.”

**Girdano, Daniel A., George S. Everly, and Dorothy E. Dusek.** *Controlling Stress and Tension: A Holistic Approach*. Allyn & Bacon, 1996. (Contains chapters on Yoga, meditation, breathing and relaxation, etc.)


Abstract: Mindfulness-Based Stress Reduction (MBSR) is an 8-week clinical intervention developed by Kabat-Zinn and colleagues in the 1970s and 1980s. Mindfulness meditation is the key component of MBSR, and patients are typically asked to meditate 45 minutes daily. The present study aimed to assess the directionality of the relationship between meditation and stress. This was done with path analysis. The study also examined stress reactivity’s role in meditation’s healthful effects. Finally, the study assessed the relative importance of different aspects of meditation practice, including length and frequency of meditation. The sample included 180 persons practicing meditation similar to mindfulness meditation, recruited from meditation centers around the U.S. Subjects completed self-report measures on meditation habits, the Weekly Stress Inventory (WSI), and the Short Form-36V health survey. To assess causality between meditation and stress reactivity, the WSI and the meditation questionnaire were re-administered two weeks after initial data collection. Data were collected primarily via the internet. The first path analysis compared two models differing only on the causal direction of the path between stress reactivity and recent meditation. The model positing recent meditation influencing stress reactivity provided a better fit to the data than the model positing stress reactivity influencing meditation practice. The second analysis examined the path coefficients of a similar but fully identified model. This also showed meditation’s influence on stress reactivity to provide a better fit to the data than the alternative model. A strong negative association was found between stress reactivity and health. Also, frequency of meditation was as important to stress reactivity as hours meditated. Additionally, when examining the differential importance of recent meditation vs. lifetime meditation experience, recent meditation was associated with emotional health, vitality, and stress reactivity, whereas lifetime meditation experience was relatively unimportant. This study has some implications for MBSR, including the importance of continued meditation practice after patients complete MBSR. Another such implication concerns the equal importance of frequency of meditation vs. length of meditation sessions. This study is an initial effort at addressing the role of stress reactivity in meditation’s effects. Further efforts studying these phenomena with clinical populations are needed.


On how the regular practice of Yoga have helped physician Eric Grief cope with the stress of his medical practice.

“Through regular and relaxed deep breathing, I have found a remarkable improvement in my overall demeanor and a reduced tension level. Yoga classes have helped me realize patients are fully responsible for their own well-being: a valuable lesson for me and an essential tool in my overall strategy to avoid exhaustion. Applying the lessons and tools gained from yogic teachings has also helped me be a better role model and advisor to my patients and loved ones. While I still cringe occasionally when I see certain patients’ names on my daily list, I remember to take a deep breath and conjure up an image of calmness . . .
“At the end of each class, I feel wonderfully relaxed and my mind is less preoccupied than it is at other times of the day. I can dwell on how happy I am to have my health and my family and can focus better on being truthful, pursuing my goals and telling my family how much I appreciate them.

“Being more truthful often translates into clearer communication with my patients, too. For example, when I do not receive a direct answer to a question I have posed to a patient, rather than letting it go due to time constraints, I now seize the opportunity to either re-pose the question or point out to the patient I did not receive a definite answer. Usually, this pays off in terms of making a more definite diagnosis and lets patients know they can be more open in our interaction . . .”


“Have you ever felt so fatigued or stressed that you could not find the energy to practice the most basic yoga postures that you learned in a Level I class?”


Abstract: At work employees face numerous psychological stressors that can undermine their work performance. These stressors, stemming from a variety of possible causes, have enormous health and financial impacts on employees as well as employers. Stress has been shown to be one of the factors leading to musculo-skeletal disorders (MSDs) such as: include back pain, carpal tunnel syndrome, shoulder or neck tension, eye strain, or headaches. Yoga is an ancient form of exercise that can reduce stress and relieve muscular tension or pain. Practicing yoga at the workplace teaches employees to use relaxation techniques to reduce stress and risks of injury on the job. Yoga at the workplace is a convenient and practical outlet that improves work performance by relieving tension and job stress.

**Guyot, Félix.** *La Relaxation à la Lumière du Yoga*. Paris: Tallandier, [1956]. [In French.]


From the publisher: “Stress is a leading cause of many health problems. Being unable to relax also significantly decreases our quality of life. We hear it all the time—you need to reduce stress and relax. Yet we are seldom instructed as to how to achieve this result. Meditation and [Kripalu] yoga instructor, Gary Halperin, has taught thousands of people how to meditate in order to take control of their lives. . . . [Through the] simple easy-to-use format of *Feel Better Now . . . Meditation*, anyone can quickly learn to use classical meditation methods to reduce stress and enjoy life.

“This book is for anyone who wants to learn a method to relax, those who have never meditated and want to learn, as well as experienced meditators who want a new perspective on the practice. In one or a few sittings, you can learn how and why to meditate. You will learn that meditation is about practicing your focus on process without worrying about the results.”
Contents: Introduction, What is meditation?, How to meditate, Benefits of meditation, meditation practice and anchors, After your first meditation, Review, Frequent questions, Conclusion

Note: This book is recommended by several Kripalu Yoga teaches as a very clear and accessible introduction to meditation.


**Hardt, J. V.** *Relaxation During Breathing Feedback, Yogic Breathing, and Alpha Feedback.* Langley Porter Neuropsychiatric Institute.


**Harrop, Denise.** The yoga way to no stress at Christmas. *Yoga & Health*, Dec 2004, pp. 25-33.


“Stress has been described as a modern epidemic and the number one threat to the physical health, emotional well-being, and productivity of modern men and women. This book goes beyond simplistic and mechanical explanations of the stress response to a comprehensive view of how mind, body, and emotions interact to create stress. . . . [provides] practical techniques to relax both body and mind and to restore health and harmony to our lives. Exercise, diet, meditation, relaxation procedures, breathing techniques, and guidelines for a healthy lifestyle are presented in a manner that is easy to understand and apply.”

**Hassanagas, Pavlos K.** Measuring the EEG changes during and after relaxation. Athens, Greece: International Association of Yoga Science Centers, 1986. Email: yogscience@otenet.gr, URL: http://www.yoga.org.mk.


Abstract: Growing scientific evidence, clinical experience, and community attitudes are encouraging a shift to more natural and holistic forms of therapy as alternatives or adjuncts to pharmacological approaches to a variety of conditions. Meditation and relaxation exercises have a wide range of applications but are especially useful in treating stress and related disorders. They are easily adapted to the general practice setting by adequately trained practitioners who have first hand experience of them. In this short article the practical and experiential aspects of such exercises are examined, which, combined with examining the scientific evidence, provide a much more complete understanding of their potential uses and therapeutic effects.
Hayward, Sheila. *Relax Now: Removing Stress from Your Life.* Sterling Publications, 1998. (Discusses Yoga *asanas*, breathing, exercise, massage, reflexology, T’ai Chi, and other topics and offers various techniques to help reduce daily stress.)


High stress and low back pain. *Yoga International*, Jul 1999, p. 82.


Primarily on Yoga’s stress-relieving effects.


Abstract: With the aim of evaluating the sympathetic-adrenal medulla system in subjects practicing transcendental meditation (TM), their plasma catecholamine levels were determined at two different times of day. The study group consisted of 19 subjects who regularly practice either TM or Sidhi-TM technique, with a control group made up of 16 healthy subjects who had not previously used any relaxation technique. Catecholamine plasma levels were determined by high performance liquid chromatography, at 0900 and 2000 h. Morning and evening norepinephrine (NE) levels and morning epinephrine (E) levels were significantly lower in the TM group than in the control subjects (morning NE levels, pg/ml, mean+/S.E.: TM group 136.6+/13.0, control 236.8+/21.0, P=.0001; evening NE levels: TM group 119.7+/10.8, control 175.6+/17.4, P=.009; morning E levels, pg/ml: TM group 140.2+/10.6, control 196.7+/23.8, P=.019). No differences were recorded for evening E levels and dopamine (DA) levels. No significant differences were found for catecholamine levels measured at different times of day in the TM group, demonstrating a lack of daily hormonal rhythm. Anxiety levels were similar in both groups. Based on the results obtained, it can be considered that the regular practice of TM has a significant effect on the sympathetic-adrenal medulla system. A low hormonal response to daily stress caused by sympathetic tone regulation through regular TM could explain our results, as well as the physiological and other effects related to the field of health described in those who practice meditation.


Iris, Keith F. Mindfulness meditation and stress/anxiety. 28 Mar 1998. Article available online: http://www.behavior.net/cgi-bin/nph-display.cgi?MessageID=62&Top=-1&config=meditation&uid=nC1M8.user&new=0&adm=0.


“This set of two CD-ROMs presents a therapeutic and holistic approach to stress relief. A series of sequenced asana classes for 63 different health problems makes this [set] truly one of [a] kind. These CD-ROMs also include a 40-minute interview with Yogacharya B. K. S. Iyengar [and] a 20-week learning class for first time yoga students, as well as preparations, benefits, and cautions for all asanas that are demonstrated in a comprehensive manner.”


“To relieve the physical symptoms of sitting at your desk all day—tight shoulders, backache, neck tension—practice these modified yoga postures.”


Abstract: 114 participants in four groups practiced 25 minutes of progressive muscle relaxation, yoga stretching, imagery, or a control task. Before and after training, participants took state versions of the Smith Quick Stress Test (which measures Somatic Stress, Negative Affect, and Worry) and the Smith R-State Inventory (which measures relaxation-related states Disengagement, Physical Relaxation, Mental Relaxation, Strength and Awareness, Joy, Love and Thankfulness, and Prayerfulness). After training, all took both the Verbal and Figural forms of the Torrance Tests of Creative Thinking. At posttest, groups' scores did not differ on Creativity; however, when compared with yoga stretching, imagery trainees had lower posttest scores on Negative Affect. Both yoga stretching and imagery trainees displayed higher scores on self-reported Physical Relaxation than did controls. Progressive muscle relaxation trainees had lower scores on Somatic Stress than controls. Paradoxically, for all relaxation trainees, Disengagement (feeling "distant, far away, indifferent") correlated positively with both Negative Affect and Physical Relaxation, suggesting that disengagement in relaxation may not lead to relaxation-induced anxiety but may help one cope with such anxiety.


“A single yoga session can lower levels of the stress hormone cortisol.”

“In a recent study conducted by Thomas Jefferson Medical College in Philadelphia and the Yoga Research Society, 16 healthy new yogis participated in a 50-minute yoga class every day for seven days. On the day prior to the first class, they were instructed to sit quietly—reading and writing—for 50 minutes.

“The subjects’ cortisol levels didn’t changed appreciably during the sitting period; they showed just the normal decrease that usually takes place in the late morning. But when the researchers measured the cortisol levels before and after the yoga class—which included postures such as Sravangasana (Shoulderstand), Salabhasana (Locust Pose), Vrksasana (Tree Pose) and Halasana (Plow Pose)—they discovered a significant decrease after the class.

“. . . This particular study attained a “p value” . . . of .001.”


______. Learning to Teach Restorative Yoga workshop. 25 hours. Email: JudithYoga@aol.com.


Meditation is a conscious mental process that induces a set of integrated physiologic changes termed the relaxation response. Functional magnetic resonance imaging (fMRI) was used to identify and characterize the brain regions that are active during a simple form of meditation. Significant (p<10 -7) signal increases were observed in the group-averaged data in the dorso-lateral prefrontal and parietal cortices, hippocampus/parahippocampus, temporal lobe, pregenual anterior cingulate cortex, striatum, and pre- and post-central gyri during meditation. Global fMRI signal decreases were also noted, although these were probably secondary to cardio-respiratory changes that often accompany meditation. The results indicate that the practice of meditation activates neural structures involved in attention and control of the autonomic nervous system.


Based on Phoenix Rising Yoga Therapy. Combines Yoga, mindfulness-based stress reduction meditation, journaling, and lifestyle-changing practices with personal stories and anecdotes.


**Ludwigsen, Kris.** Taking the stress out of being stressed out. HealthWire, 20 May 1997. (On Kaiser Permanente’s work stress group for employees, and tips for handling work stress, including yoga.)


On alternative schools in the San Francisco Bay Area that utilize yogic and meditative principles and techniques to help students cope with stress, practice kindness, and so on.


Abstract: Shavasan is known to enhance one’s ability to combat stressful situations. The present study was planned to determine if shavasan could modulate the physiological response to stress induced by cold pressor test (CPT) and the possible mechanisms involved. Ten normal adults were taught shavasan and practiced the same for a total duration of seven days. RR interval variation (RRIV), deep breathing difference (DBD), and heart rate, blood pressure and rate-pressure-product (RPP) response to CPT were measured before and immediately after shavasan.
Shavasan produced a significant increase in DBD and an appreciable but statistically insignificant increase in RRIV suggesting an enhanced parasympathetic activity. Significant blunting of cold pressor-induced increase in heart rate, blood pressure and RPP by shavasan was seen during and even five minutes after CPT suggesting that shavasan reduces the load on the heart by blunting the sympathetic response. It is concluded that shavasan can enhance one’s ability to withstand stress induced by CPT and this ability can be achieved even with seven days of shavasan training.


Abstract: A student under optimal stress does bring out his or her best, However extremes of stress can result in stress induced disorders and deteriorating performance. Can yoga be of benefit in stress induced effects in medical students? The present study was conducted in first MBBS students (n = 50) to determine the benefit if any of yogic practices on anxiety status during routine activities and prior to examination. Feedback scores were assessed to determine how the students had benefited from the practices. Anxiety status as assessed by Spillberger’s anxiety scale showed a statistically significant reduction following practice. In addition the anxiety score which rose prior to exams showed a statistically significant reduction on the day of exam after practice. These results point to the beneficial role of yoga in not only causing reduction in basal anxiety level but also attenuating the increase in anxiety score in stressful state such as exams. The results of the exam indicated a statistically significant reduction in number of failures in yoga group as compared to the control group. The improvement in various parameters such as better sense of well being, feeling of relaxation, improved concentration, self confidence, improved efficiency, good interpersonal relationship, increased attentiveness, lowered irritability levels, and an optimistic outlook in life were some of the beneficial effects enjoyed by the yoga group indicated by feedback score.


**Mann, Denise.** Meditation does ease stress: Stressed out people have fewer complaints after learning “mindfulness.” Article available online: http://content.health.msn.com/content/article/1728.83226.

“Of 62 ‘stressed-out’ people, those who participated in an eight-week mindfulness program reported less psychological distress, less stress from daily hassles, and fewer medical symptoms than those who did not participate in the training. The program included one 2.5-hour class each week, one eight-hour retreat, and training in four methods of meditation, general yoga postures, and other stress-busting techniques.
“This is the first study to look at meditation and stress-reduction techniques in people who reported high stress levels, but did not have a diagnosed psychiatric disorder.”

The study was conducted by IAYT member Kimberly Williams, Ph.D., a research assistant professor in the department of community medicine and director of the Program for Integrative Medicine at West Virginia University in Morgantown.


Abstract: This study compared the psychological effects of Progressive Muscle Relaxation (PMR) and breathing exercises. Forty-two students were divided randomly into two groups and taught PMR or breathing exercises. Both groups practiced for five weeks and were given the Smith Relaxation States Inventory before and after each session. As hypothesized, PMR practitioners displayed greater increments in relaxation states (R-States) Physical Relaxation and Disengagement, while breathing practitioners displayed higher levels of R-State Strength and Awareness. Slight differences emerged at Weeks 1 and 2; major differences emerged at Weeks 4 and 5. A delayed and potentially reinforcing aftereffect emerged for PMR only after five weeks of training—increased levels of Mental Quiet and Joy. Clinical and theoretical implications are discussed. Copyright 2001 John Wiley & Sons, Inc.


**McShulskis, Elaine.** Ease stress with yoga. *HRMagazine*, Jun 1996, 41(6). (On Yoga classes helping employees and residents of the Coast Guard’s Governors Island base mitigate the stress of relocation.)


“Using meditation over a longer period of time can have an enduring beneficial effect on your brain activity. One who meditates regularly experiences a last relaxing effect in daily life.”


Topics covered: What is mindfulness meditation? How does it help with stress?

**Meditation for stress or sudden shock.** Article available online: http://transitionstressmanage.com/suddenshock.asp.


**Milgrom, Philip L.** How yoga alleviates stress. Article available online: http://www.byregion.net/articles-healers/Yoga_Stress.html.


**Miller, Marcia.** The edge of overwhelmed. Article available online: http://www.yogaonhigh.com/archives/overwhelmed.html.


Abstract: Several studies suggest that behavioral techniques such as meditation and relaxation may be associated with reduced end organ adrenergic receptor sensitivity. Thus far the evidence supporting this hypothesis has been indirect. We present preliminary findings showing reduced beta-adrenergic receptor sensitivity in a group of subjects practicing Transcendental Meditation. The meditation group (N = 10), compared to controls (N = 10), had a lower percentage of
functional lymphocyte beta-adrenergic receptors ($p = 0.009$), but showed no difference in total receptor number or plasma catecholamines. There were no differences between the groups in Type A behavior, the Type A components, exercise, or family history of hypertension. The results provide some support for studies postulating that meditation is associated with reduced sympathetic adrenergic receptor sensitivity, and provide encouragement for the efficacy of receptor measurement in psychophysiology research.


Contents: Introduction, Concept of stress, Stress–induced problems and management, Concept of stress and its management according to Yoga, Stimulation–relaxation combine[d]—the core, Recognition is half the solution, Stress levels and release of stress, Executive growth, Depth of perception and expansion of awareness, Working through the group, Progress in tune with nature, A holistic lifestyle for effective stress management, Evaluations


“Academic pressures, binge drinking, poor diet, sleep deprivation, and substance abuse are facts of life at most colleges and universities. Recent brain research documents how this college experience can take a terrible toll on a student’s brain—and what can be done to reverse the damage and develop the total potential of the brain.”

“Stressful experiences lead to dysfunctions of the prefrontal cortex—critical areas regulating judgment, planning, decision making, moral reasoning, and sense of self. This conference [showcased] new findings on the effects of stress on brain functioning and the results of more than 30 years of research on the Transcendental Meditation technique on reversing the debilitating effects of stress and promoting total brain functioning for the full expression of human development.”

**National Workshop on Stress and Its Management by Yoga Relaxation Techniques.** Department of Physiology, JIPMER, Pondicherry, India 16-18 March 2005.

Summary of events by Dr. Ananda Balayogi Bhavanani, ICYER: “More than 55 delegates were selected to participate in this workshop that had invited 17 . . . faculty members from all over
India. The faculty members were from eminent medical and Yoga institutions . . . such as AIIMS, NIMHANS, JIPMER,ICYER, Krishnamacharya Yoga Mandiram, Moraji Desai National Institute of Yoga, Aurobindo Ashram, Manipal Hospital and Dept of Psychology, Madras University.

“The eminent Yogi Shri TKV Desikachar of the Krishnamacharya Yoga Mandiram, Chennai, presented a stimulating healing chant at the inauguration of the workshop in the company of his Dharmapatri Smt Menaka Desikachar. All the participants were bathed in the Divine chanting as the vibrations of Nada Yoga unfolded through the chanting of Vedic mantras for healing as well as for the healer. The group chant of the Asatoma Mantra created the spiritual ambiance that contributed to the success of the entire workshop.

“Amma, Yogacharini Meenakshi Devi Bhavanani, Director ICYER presented an enlightening guest lecture entitled “Divine Indian Music and Dance for the Management of Stress” that was followed by a spell-binding cultural programme by the Yoganjali Natyalayam troupe. Fear is the key cause of stress due to dichotomy of spirit, and Indian music and dance help us realize that we are one with the Divine. Once we have this realization, there is no cause for fear and thus all stress is lost said Amma in her inimitable manner . . .

“Amma and Yogacharya Dr Ananda Balayogi Bhavanani were amongst the . . . panelists on the open forum that was held to generate public interest in the science of Yoga. The panel that included Dr Madanmohan, Dr RL Bijilani, Dr Alok Pandey, Dr A Malathi, Dr KK Deepak, and Shri Girish Jha tackled many questions on the role of Yoga in modern life and methods of practice. Dr KR Sethuraman and Dr Chandraeskar joined the . . . panelists on another panel discussion held the next day where different questions on Yoga and its management of stress were discussed.

“Ten different invited talks were given in the three-day workshop in addition to many practical and practice sessions of yogic techniques to manage and combat stress. Dr GK Pal, chairman scientific committee, organised a session on experimental techniques for Yoga research where the participants were exposed to numerous techniques such as autonomic testing and HRV analysis. A hands-on training was imparted in small batches so that all participants took home a lot of the knowledge so gained . . .

“Karma Yoga Shironmani Dr Madanmohan, Director-Professor and Head, Department of Physiology, JIPMER, was the Yogic-scientific brain behind this much needed workshop and had put in months of dedicated work in planning every intricate details to perfection. All participants and faculty appreciated the smoothness with which the entire workshop was held and felt that more such workshops and seminars needed to be organized to present the right picture of scientific Yoga to the world. Dr Madanmohan was ably assisted in his work by his faculty, residents, scholars and staff at JIPMER . . .

“A grant from the Central Council for Research in Yoga and Naturopathy (CCRYN), Ministry of Health and Family Welfare, Govt of India, New Delhi, sponsored the workshop.”


From the abstract: The paper summarizes some non-specific stress factors of work in the health services (e.g., shift work) and some relatively specific stressing factors (e.g., contact with grief, intense negative emotion, and death). It deals also with the consequences of excessive stress,
including “burnout syndrome” . . . In the conclusion the author mentions the possibility to use yoga in the prevention of occupational stress in the health services.


Abstract: Increasing materialism in society is resulting in more widespread nervous tension in all age groups. While some degree of nervous tension is necessary in everyday living, its adverse effects require that we must learn to bring it under control. Total tension is shown to have two components: a controllable element arising from factors in the environment and the inbuilt uncontrollable residue which is basic in the individual temperament. The effects of excessive or uncontrolled stress can be classified as 1) emotional reactions such as neurotic behavior (anxiety hypochondria, hysteria, phobia, depression obsessions and compulsions) or psychotic behavior and 2) psychosomatic reactions (nervous asthma, headache, insomnia, heart attack). Nervous energy can be wastefully expended by such factors as loss of temper, wrong attitudes to work, job frustration and marital strains. Relaxation is the only positive way to control undesirable nervous tension and its techniques require to be learned. A number of techniques (progressive relaxation, differential relaxation, hypnosis, the use of biofeedback, Yoga and Transcendental Meditation) are described and their application to dental practice is discussed.


From the publisher: “Stress is not a necessary part of life says [the author]. Stress, he tells us, arises when we let fear and self-doubt control our thoughts and actions. He then shows us how to take charge of the powers of our mind, addresses the roots of our fears, and offers real, workable solutions to the epidemic of stress in the world today.”


Abstract: The main purpose of this study was to examine the usefulness of Hatha yoga for a non-clinical population. Particularly, this study examined whether using Hatha yoga (a style of yoga involving a variety of standing or seated poses and postures alone and/or in combination with deep breathing meditation techniques) was associated with low levels of daily stress. The sample was comprised of 111 adults from the greater Los Angeles, California region and the west suburbs of Detroit, Michigan. Participants completed a packet of self-report questionnaires, including The Daily Stress Inventory (Brantley & Jones, 1989), the COPE questionnaire (Carver, Scheier, & Weintraub, 1989), and The Self-Efficacy and Exercise Habits Survey (Sallis, 1988). Also included in the packet was a short-answer demographic questionnaire to assess whether or not participants engaged in Hatha yoga. Fifty-three participants reported using Hatha yoga versus 58 who had not used Hatha yoga. The majority were European American women, Jewish, highly educated, and between the ages of 29 and 40. The results demonstrated that Hatha yoga users did not have significantly lower levels of daily stress than those who had not used Hatha yoga. On the other hand, Hatha yoga users were more likely than non-users to have higher levels of self-efficacy regarding consistent use of exercise activities including Hatha yoga, and to use a greater number of coping skills during periods of stress. Further analysis revealed that men were more likely than women to have higher levels of self-efficacy and were also more likely to use a greater number of coping skills during stress. This study showed that although using Hatha yoga did not make a difference in one’s level of daily stress, some benefits were correlated with Hatha yoga use. Additional research is necessary to further understand the benefits of using Hatha yoga, and to investigate its efficacy in lowering daily stress for a non-clinical population.


Ott, Mary Jane. Yoga as a clinical intervention: Pain control and stress reduction may be just a breath away. ADVANCE for Nurse Practitioners, Jan 2002, 10(1):81. Article available online: http://www.advancefornp.com (you must register at the site). Author is a member of IAYT and may be contacted at: MaryJane_Ott@DFCI.Harvard.Edu.

“As nurse practitioners, we are consistently faced with the challenge of identifying and implementing safe, innovative ways to promote health and manage the health problems experienced by our patients. Yoga is a practice that you and your patients may find helpful to cope with stress, nurture health and support healing.”


Summary: The state of the mind and body are intimately related, and stress produces a state of both physical and mental tension. Yoga is recognized as a form of mind-body medicine in which
physical postures and breathing exercises improve muscle strength, flexibility, blood circulation and oxygen uptake as well as hormone function. In addition, the relaxation induced by meditation helps to stabilize the autonomic nervous system with a tendency towards parasympathetic dominance. Physiological benefits that follow help Yoga practitioners become more resilient to stressful conditions and reduce risk factors for various diseases.

Pasek, T. Cwizzenia relaksowo-koncentrujace jogi [Relaxation and concentration exercises of yoga]. Rekreacja fizyczna, 19073, 16(138). [In Polish.]


_________, et al. Problems of the influence of relaxation-concentration exercises according to yoga on resistivity. Wych Fiz I Sport, 1971, 4:141.


From the website: “Three ten minute lessons designed specifically for people in the workplace who are subject to job related stress which results in muscular tension in the upper back/shoulder/neck area. These stretching exercises are performed sitting on a chair. There are a total of 20 different exercises that were tested in group sessions and proven to dramatically reduce tension, pain and stress in the upper body.”

_________. Upper Body Chair Exercises. URL: http://yogaone.com/cgi-bin/leeshop/open.pl.

From the website: “Two fifteen minute lessons containing approximately 15 different exercises. These sitting exercises will decrease muscular tension while increasing strength, flexibility and range of motion in the upper body. These exercises are suitable for people of all ages, and especially for chair-bound individuals. The exercises stretch the arms in forward, upward, downward and backward poses, work the shoulder joints through stretches, shrugs, slants and circles, includes side bends as well as spine twists, rotator cuff exercises, and incorporates deep neck and upper shoulder stretches to relieve tension.”


Reports on Dr. Ramesh Manocha’s meditation research at Royal Hospital for Women. A pilot study of 50 people found “real and measurable differences” from meditation on occupation stress.


Prager-Decker, Iris. “Stressing” relaxation in the classroom. [Publisher unknown], 1979.

Abstract: A rationale is offered for incorporating relaxation training in elementary school classroom activities. Cited are research studies which focus on the reaction of children to stressful life changes and resulting behavioral and physical disorders. A list is given of significant life events which may be factors in causing diseases or misbehavior in children. Described is a unit which adapted such techniques as yoga, deep muscle relaxation, and guided visual imagery to help primary age children cope with stress. Included in the unit, designed to be both experiential and cognitive, are pictures and cartoons depicting people in stressful situations, charts illustrating the reaction of the human body to stress, dramatic play stories designed to teach specific relaxation skills, and descriptions of relaxation periods in the classroom. A discussion is presented on implementing and evaluating a unit of this type. A bibliography and a list of resources for relaxation techniques are included.


Abstract: Many elementary school students perform below their ability levels due to excessive anxiety and stress. Research reveals negative correlations between general anxiety and test anxiety, and scores on intelligence tests. Studies have shown that changes in anxiety level are related to changes in intelligence quotient scores. Further, anxiety affects the more intelligent as well as the average student; anxiety level is as effective as the intelligence quotient in predicting reading grades; anxiety is an important part of the personality of underachieving children; and anxiety has a negative effect on a variety of learning tasks, especially complex learning. Anxiety also has been found to be related to dependence, hostility and aggression, low peer status, and poor relationships with teachers. Consequently, relaxation training for reducing students' anxiety has become a part of the school curriculum in several schools. Methods of reducing anxiety through relaxation include systematic desensitization, yoga, meditation, guided fantasy, biofeedback, and deep muscle relaxation (DMR). Teaching DMR to children involves establishing general goals and training objectives, arranging the setting, using the DMR training script correctly, acquiring the experience of relaxation in order to effectively lead DMR sessions, organizing and facilitating the DMR exercises, conducting group discussions, and evaluating outcomes. The document concludes with a series of 10 experimentally tested DMR exercises.
which progress from relaxing various parts of the body to relaxing the whole body while breathing deeply.


Raghunam, R. Stress and yoga. Paper presented at the 10th International Conference on Yoga for Positive Health, University of South Florida, Tampa, 15-17 Dec 2000. Email: vkyogas@yahoo.com.


Rama, Swami. *Stressless Living* video. Honesdale, Pa.: Himalayan Institute Press, 2000. (From the publisher: “Stress is created when you search for peace outside yourself. In this video, Swami Rama explains that true peace already exists inside your mind.”)


Abstract: This study examined the effects of mindfulness-based stress reduction (MBSR) on health-related quality of life and physical and psychological symptomatology in a heterogeneous patient population. Patients (n=136) participated in an 8-week MBSR program and were required
to practice 20 min. of meditation daily. Pre- and post-intervention data were collected by using the Short-Form Health Survey (SF-36), Medical Symptom Checklist (MSCL) and Symptom Checklist-90 Revised (SCL-90-R). Health-related quality of life was enhanced as demonstrated by improvement on all indices of the SF-36, including vitality, bodily pain, role limitations caused by physical health, and social functioning (all P<.01). Alleviation of physical symptoms was revealed by a 28% reduction on the MSCL (P<.0001). Decreased psychological distress was indicated on the SCL-90-R by a 38% reduction on the Global Severity Index, a 44% reduction on the anxiety subscale, and a 34% reduction on the depression subscale (all P<.0001). One-year follow-up revealed maintenance of initial improvements on several outcome parameters. We conclude that a group mindfulness meditation training program can enhance functional status and well-being and reduce physical symptoms and psychological distress in a heterogeneous patient population and that the intervention may have long-term beneficial effects.


“Finals week is one of the most stressful times during the semester. In many classes, the final test can make or break a grade. And while many students stay up late cramming for their finals and stressing out about them, there are some simple, out-of-the-ordinary ways students can reduce and control their stress levels.

“Yoga instructor Sarada Holik suggested students try yoga to help relieve stress. The practice of yoga unites the mind, body and spirit, and if the correct poses are held, it can lead to a less stressful finals week.

“‘When you do yoga you are not focusing on problems, you’re focusing on letting go of stress and tension,’ Holik said. ‘Yoga is meditation in action.’

“Holik recommended doing the triangle pose, the bridge pose, forward bends and plow/inversions to help minimize stress and anxiety.

“For students who are not familiar with yoga, the Recreation Center offers yoga classes throughout the semester.”


**Roots and Wings Yoga Restorative Sequence.** Sequence was used in the Yoga ‘93 Iyengar Yoga National Convention. Available online: http://www.yoga.com.


“Amid a floor covered with yoga mats, about 30 members and newcomers [of the Yoga and Meditation Society] practiced the ancient art of yoga Wednesday night in the White Building . . .”


“Attitudinal and behavioral changes: Anecdotal reports by patients who completed the Stress Reduction and Relaxation Program indicated that many experienced changes far more profound than the documented reduction of physical and psychological symptoms. These changes were described as greater peace of mind; more patience; less anger and temper outbursts; better interpersonal communication; more harmonious relations with family members; improved parenting skills; more restful sleep; decreased use of medications for pain, sleep, and anxiety; decrease or cessation of cigarette smoking; weight loss; greater acceptance of aspects of life over which they have no control; greater self-knowledge; and a marked improvement in overall sense of well-being. Patients often expressed surprise that these dramatic changes had occurred in such a short time.”


Abstract: Objective: To determine whether completing a mindfulness-based stress reduction (MBSR) program would affect the general health, health-related quality of life, sleep quality, and family harmony of Spanish- and English-speaking medical patients at an inner-city health center. Materials and Methods: An intervention group of 68 patients (48 Spanish-speaking and 20 English-speaking) completed the SF-36 Health Survey and two additional questions about sleep quality and family harmony before and after completing the 8-week MBSR program. A comparison group of 18 Spanish-speaking patients who received no intervention completed the same questionnaire at the same intervals. Results: Sixty-six percent of the total intervention group completed the 8-week MBSR program. There was significant co-morbidity of medical and mental health diagnoses among the intervention and comparison groups, with no differences in the mean number of diagnoses of the total intervention group, the comparison group, or the Spanish- or English-speaking intervention subgroups. Compared with the comparison group, the intervention group showed statistically significant improvement on five of the eight SF-36 measures, and no improvement on the sleep quality or family harmony items. Conclusions: MBSR may be an effective behavioral medicine program for Spanish- and English-speaking inner-city medical patients. Suggestions are given for future research to help clarify the program’s effectiveness for this population.

CONTEXT: Research on mindfulness-based stress reduction (MBSR) has focused on measuring symptom reduction in middle-class and working-class populations. The present study examined inner-city patients’ healthcare utilization before and after an MBSR intervention. OBJECTIVE: To determine whether completion of an MBSR program resulted in changes in healthcare utilization in an inner-city population. DESIGN: Medical chart review compared the number and diagnoses of health center visits during the year before patients entered the MBSR program with the year following completion of the program. SETTING: The Community Health Center in Meriden, Conn. PATIENTS: The chart review process examined healthcare utilization patterns for 73 patients: 54 who completed the MBSR program in Spanish and 19 who completed the program in English. The focus of this study is a subgroup of 47 patients for whom a complete year of data were available before and after the intervention. INTERVENTION: An 8-week course in MBSR. MAIN OUTCOME MEASURES: The number and diagnoses of patients’ health center visits before and after completion of the MBSR program. RESULTS: A significant decrease in the number of chronic care visits was found among the 47 patients for whom complete data were available. The 36 patients who completed the Spanish courses demonstrated a significant decrease in total medical visits and chronic care visits. CONCLUSIONS: The results of this study suggest that MBSR may help contain healthcare costs by decreasing the number of visits made by inner-city patients to their primary care providers after completing the MBSR program.


Ruggieri, Mary Jo. Can’t stress it enough—relax for better health. Article available online: http://www.byregion.net/articles-healers/Yoga_Health.html
Excellent brief overview of the problems associated with prolonged stress, with a short section on Yoga as an aid.


On Michael Lee’s new book, Turn Stress into Bliss, including several exercises one can do to distress.
Salomon, G. [A method to find alertness, brain relaxation, stress reduction, improved vision and more energy.] *Ugeskr Laeger*, 23 Oct 1989, 151(43):2823-2824. [Article in Danish.]


_________. *Relaxation* audiotape. Iyengar Yoga Institute of San Francisco. URL: http://www.iyisf.org/resources/bookstore.html. 60 minutes.


Abstract: Psychosocial stress contributes to high blood pressure and subsequent cardiovascular morbidity and mortality. Previous controlled studies have associated decreasing stress with the Transcendental Meditation (TM) program with lower blood pressure. The objective of the present study was to evaluate, over the long term, all-cause and cause-specific mortality in older subjects
who had high blood pressure and who participated in randomized controlled trials that included the TM program and other behavioral stress-decreasing interventions. Patient data were pooled from 2 published randomized controlled trials that compared TM, other behavioral interventions, and usual therapy for high blood pressure. There were 202 subjects, including 77 whites (mean age 81 years) and 125 African-American (mean age 66 years) men and women. In these studies, average baseline blood pressure was in the pre-hypertensive or stage I hypertension range. Follow-up of vital status and cause of death over a maximum of 18.8 years was determined from the National Death Index. Survival analysis was used to compare intervention groups on mortality rates after adjusting for study location. Mean follow-up was 7.6 ± 3.5 years. Compared with combined controls, the TM group showed a 23% decrease in the primary outcome of all-cause mortality after maximum follow-up (relative risk 0.77, p = 0.039). Secondary analyses showed a 30% decrease in the rate of cardiovascular mortality (relative risk 0.70, p = 0.045) and a 49% decrease in the rate of mortality due to cancer (relative risk 0.49, p = 0.16) in the TM group compared with combined controls. These results suggest that a specific stress-decreasing approach used in the prevention and control of high blood pressure, such as the TM program, may contribute to decreased mortality from all causes and cardiovascular disease in older subjects who have systemic hypertension.


Contents: The Nature of Stress; The Physiology of Stress; Stress and Disease; Toward a Psychology of Stress; The Stress Emotions: Anger and Fear; Stress-Prone and Stress-Resistant Personalities; Stress and Human Spirituality; Cognitive Restructuring; Behavior Modification; Journal Writing; Art Therapy; Humor Therapy (Comic Relief); Creative Problem Solving; Communication Skills; Time Management; Additional Coping Techniques; Diaphragmatic Breathing; Meditation; Hatha Yoga; Mental Imagery and Visualization; Music Therapy; Massage Therapy; T’ai Chi Ch’uan; Progressive Muscular Relaxation; Autogenic Training; Clinical Feedback; Nutrition and Stress; Physical Exercise and Nutrition; Creating Your Own Stress-Management Program


“Investigations into the nature of stress at The Yoga Institute have shown that excessive stress (or technically “distress”) can cause cardiovascular problems, respiratory problems (like asthma, etc.), metabolic problems (like diabetes), problems with the digestive apparatus (ulcers, etc.), problems related with bones and joints (arthritis, etc.), and above all disturbed emotions and instability of mind . . .

“Yoga states (Yoga Sutra, Ch. I:1-2, with Vyasaabhaya) that the source of stress is in the mind, deep into the very psychic structure of the mind. The mind is made up of three Gunas of nature (Tamas – leading to dullness, Rajas – leading to hyperactivity, Sattva – pause and poise). According to the dominion of one or more of the Gunas of nature, we become prone to stress.

“The preponderance of Tamas creates a dull and stupid personality, which can create stress out of nothing. This type of personality lacks clarity, is irrational, is excessively emotional, and lacks will power and does not want to evolve a strategy for coping with stress. Those who are Rajas
dominated, the “type A” of modern psychology, “jump” the queue as it were, everywhere, and invite unnecessary stress. Those who are of a balanced state of mind, and those who have developed faith, learn strategies to handle stress . . .”

___________.


Seth, Maulshree. For growth pangs, parents give kids a dose of yoga: Over a dozen yoga classes have mushroomed this summer and children with cases of ‘stress’ are the largest takers. Lucknow Newsline, 16 May 2005.

“‘The report card of Rishabh, who tops his class, no longer brings a smile to his mother’s face. Rishabh, a student of Class VIII, is losing appetite. After medications failed, the family has now resorted to yoga as therapy for Rishabh.

“Geeta Singh, Rishabh’s mother, was one of the many parents who had come to a city school at 5:45 am to enroll their wards to a yoga camp.

“‘My son brings back his lunch-box intact. He is under stress all the time, and gets angry very fast. We are afraid that things might worsen up as he grows up. So we have introduced him to yoga,’ Singh told Newsline.

“Another mother, Uma Chauhan, said: ‘I have tried many doctors for my eight-year-old child who is suffering from stress. Only yoga seems to relax him a bit. It is a last resort.’

“Numerous yoga schools have mushroomed in the city to handle such cases. Over a dozen yoga camps and classes have started this summer. And most are bursting at the seams.

“One of the camps visited by Newsline had 200 students in its rolls. All came with individual problems. But lack of concentration and loss of appetite seemed to be the most common.

“‘It is surprising that these days, children develop problems like spondylitis, stress, depression, lack of concentration. Instead of playing outdoors, most of the time they are suffering from stomach problems or loss of energy,’ said Surendra Yachha, Head of the Department, Pediatrics, at Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGI).

“But health problems apart, the children seem to regard yoga as fun. Some consider it a hobby or simply another form of sport.

“Even the experts are surprised by the quick headway they are making.

“‘These kids are really serious about learning yoga, they grasp various asanas so well. We never expected such results from them,’ said the instructor, Dr Saroj.”


“What is it you can’t relax—even after lying in the corpse posture for ten minutes? Un-winding is easier said than done—especially when you’re hyped up on coffee, negative emotions, hectic schedules, looming exams . . .”


Shea, Gordon F. Cost effective stress management training. *Training and Development Journal*, Jul 1980, 34:25–33. (Found the most cost effective to the least cost effective method to be: Self-hypnosis, progressive relaxation, TM, biofeedback, Yoga and Zen, and physical exercise.)


Abstract: Self-regulation is the exercise of executive control, whereby lower, shorter-term and more concrete objectives are superceded by higher, period immediately following self-regulation, self-regulatory capacity appears to be reduced or depleted. Furthermore, research indicates that relaxation and meditation may enhance performance. The present research sought to determine the degree of decrement following self-regulation as well as the incremental advantage of relaxation over other behaviors in restoration of self-regulatory capacity. Participants were assigned to six conditions: (1) The self-regulation condition was one in which participants were told to not think about a white bear, based on Wegner’s (1989) technique. (2) The free-thought (control) condition in which participants were free to think about anything. (3) Combination self-regulation (white bear) and relaxation (using deep breathing and guided imagery) condition. (4) Combination self-regulation and magazine perusal condition. (5) Combination self-regulation and sitting without any task. And (6) a relaxation condition. Following the above tasks, participants engaged in an unsolvable anagrams task. Persistence on the anagrams task was measured and served as the dependent variable. The self-regulation condition persisted on the anagrams significantly less than controls. Perusing a magazine and sitting doing nothing following self-regulation offered modest benefit to self-regulatory capacity. Engaging in relaxation following self-regulation appeared to offer significant benefit to self-regulatory capacity. Relaxation among those who had not previously engaged in a self-regulatory act provided no beneficial effect over controls. Thus, relaxation may help restore self-regulatory capacity among those experiencing decrement in capacity but did not enhance baseline persistence. Future research should examine the degree to which these effects are replicated among clinical and psychiatric populations as well as the relative effect of various similar techniques.


Side 1 provides a 13-minutes systematic reclining relaxation in the corpse pose, and side 2 provides a 9-minute deeply relaxing breathing practice in the crocodile pose.


“[India News]: New Delhi, Jan 26 : As populations in the metros swell, making life more stressful for everyone, spirituality is emerging as a money-spinning machine with executives, businessmen and even housewives looking for solace.

“Be it feng shui or transcendental meditation, spiritualism is attracting all and sundry. And it seems high prices don't deter the customers.

“Natasha Sethi, a practicing psychologist, spends around thousand rupees every week on spirituality courses.

“‘It would seem as if I had everything working out for me, but somewhere I felt a little hollow. Attending these courses has made a tremendous difference in my outlook. Although I cannot change the situations I face in life, I am much more in control of the way I react to them,’ says Sethi.

“Even books on yoga, meditation and anything remotely spiritual are doing brisk business now and fast disappearing off store shelves.

“‘There are people who take several books on meditation at the same time and always come back for more. It is not just meditation, spiritualism in any form sells. The latest bestseller is “The Monk who sold his Ferrari,”’ says Robin Sharma, a bookseller.

“More and more booksellers are finding that books on spirituality are a safe investment. PTI.”

**STATISTICS.**

According to the International Stress Management Association in the U.K. (ISMA), 53% of people—both working and unemployed—claim to experience ongoing feelings of stress (2001 survey).


“To combat academic stress at the University of California at Berkeley, several students have started a peer-led yoga and meditation class that also includes studies in Indian philosophy and mystical traditions. Part of the De-Cal program, these for-credit classes are more hands-on than traditional classes.
“Each semester, about 200 students meet twice a week for a lecture and discussion of yogic texts, and once a week for an hour-long Ashtanga session and meditation. Instructor Chris Wallace says he has seen ‘an intense, spiritual seeking in undergraduate students, which is indicative of the wave of advanced spirituality we’re going to see from Generation Y.’”


Stress Management Program. The Wellness Center, Mercy Medical Center, Durango, Colorado. Contact Janet Wilson, The Wellness Center, 970-382-1521. (Yoga-based program.)

Stress Management Program. Preventive Medicine Research Institute, 900 Bridgeway, Sausalito, California 94965, 415-332-2525. (Dr. Dean Ornish’s program for reversing heart disease, which incorporates asana and meditation.)


“A gentle healing system based on Tibetan medical practices which relieves stress and helps [one] to become more balanced and healthy. Part I: theory, breathing, and massage techniques, basic exercises. Part II: movement exercises.”


Transition Stress Management. (Kundalini Yoga based.) URL: http://transitionstressmanage.com/yogic.htm.


Abstract: Thirty-five male volunteers whose ages ranged from 20 to 46 years were studied in two sessions of yoga-based guided relaxation and supine rest. Assessments of autonomic variables were made for 15 subjects, before, during, and after the practices, whereas oxygen consumption and breath volume were recorded for 25 subjects before and after both types of relaxation. A significant decrease in oxygen consumption and increase in breath volume were recorded after guided relaxation (paired t test). There were comparable reductions in heart rate and skin conductance during both types of relaxation. During guided relaxation the power of the low frequency component of the heart-rate variability spectrum reduced, whereas the power of the high frequency component increased, suggesting reduced sympathetic activity. Also, subjects with a baseline ratio of LF/HF > 0.5 showed a significant decrease in the ratio after guided relaxation, while subjects with a ratio < or = 0.5 at baseline showed no such change. The results suggest that sympathetic activity decreased after guided relaxation based on yoga, depending on the baseline levels.


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**Vidyananda, Swami.** *Integral Yoga as Stress Management* video. Buckingham, Va.: Integral Yoga. 80 minutes.

From the publisher: “Stress is not an event, it’s our reaction to events. This video (from two live talks) shows how Yoga teaches us to control our mental reactions in order to remain calm and happy. It also examines how to ease stress through on-the-job stress-buster stretches and a variety of techniques which can change our way of looking at problems.”

_________. *Deep Relaxation and Guided Visualization for Healing* audiotape. Buckingham, Va.: Integral Yoga.

From the publisher: “... This tape leads listeners through a series of visualizations to heal and balance all parts of the body and mind while letting go of layer after layer of tension.”

_________. *Surfing in the sea of change: Stress management techniques and practices.* Integral Yoga Series workshop, Yogaville, Buckingham, Virginia.

**Vijayalakshmi, P., Madanmohan, A. B. Bhavanani, P. Asmita, and P. Kumar Babu.**


Abstract: 13 essential hypertensive patients aged 41 to 60 years were given yoga training for 60 min. daily, Monday through Saturday, for a total duration of 4 weeks. Blood pressure and heart rate (HR) were measured with noninvasive semiautomatic blood pressure monitor. Measurements were recorded before the training and at weekly intervals during the 4 week training period. Results of our study show a significant (P<0.001) reduction in resting HR and rate-pressure-product (RPP) after 2 weeks of yoga training. Systolic pressure (SP), diastolic pressure (DP) (P<0.001) and mean pressure (MP) (P<0.05) showed a significant reduction at 3 weeks of training period. After 4 weeks of training, there was further fall in SP, DP, pulse pressure (PP) (P<0.05), MP (P<0.001), HR and RPP. Isometric handgrip test before yoga training produced a significant rise in SP and MP and insignificant rise in DP, HR and RPP. After yoga training, there was a significant rise in all these parameters. Our results show that yoga training optimizes the sympathetic response to stressful stimuli like isometric handgrip test and restores the autonomic regulatory reflex mechanisms in hypertensive patients.


**Walden, Patricia, and Rodney Yee.** *Yoga Journal’s Yoga Practice for Relaxation* video. 75 minutes. Berkeley, Calif.: Yoga Journal, [date unknown].

**Walton, K. G., N. D. Pugh, P. Gelderloos, and P. Macrae.** Stress reduction and preventing hypertension: Preliminary support for a psycho-neuroendocrine mechanism. *Journal of*
Alternative and Complementary Medicine, Fall 1995, 1(3): 263–283. (Transcendental Meditation–based.)


Abstract: BACKGROUND: Dance and yoga have been shown to produce improvements in psychological well-being. PURPOSE: The aim of this study was to examine some of the psychological and neuron-endocrine response to these activities. METHODS: Sixty-nine healthy college students participated in one of three 90-min classes: African dance (n = 21), Hatha yoga (n= 18), or a biology lecture as a control session (n = 30). Before and after each condition participants completed the Perceived Stress Scale (PSS), completed the Positive Affect and Negative Affect Schedule, and provided a saliva sample for cortisol. RESULTS: There were significant reductions in PSS and negative affect (ps < .0001) and Time x Treatment interactions (ps < .0001) such that African dance and Hatha yoga showed significant declines, whereas there was no significant change in biology lecture. There was no significant main effect for positive affect (p = .53), however there was a significant interaction effect (p < .001) such that positive affect increased in African dance, decreased in biology lecture, and did not change significantly in Hatha yoga. There was a significant main effect for salivary cortisol (p < .05) and a significant interaction effect (p < .0001) such that cortisol increased in African dance, decreased in Hatha yoga, and did not change in biology. Changes in cortisol were not significantly related to changes in psychological variables across treatments. There was 1 significant interaction effect (p = .04) such that change in positive affect and change in cortisol were negatively correlated in Hatha yoga but positively correlated in Africa dance and biology. CONCLUSIONS: Both African dance and Hatha yoga reduced perceived stress and negative affect. Cortisol increased in African dance and decreased in Hatha yoga. Therefore, even when these interventions produce similar positive psychological effects, the effects may be very different on physiological stress processes. One factor that may have particular salience is that amount of physiological arousal produced by the intervention.


Purpose: To determine if participation in a Wellness-Based Mindfulness Stress Reduction intervention decreases the effect of daily hassles, psychological distress, and medical symptoms.

Subjects: A total of 103 adults, with 59 in the intervention group and 44 in the control group. Eighty-five percent of subjects completed the intervention. Fifty-nine percent and 61% of the intervention and control subjects completed the study, respectively.

Intervention. The intervention consisted of an 8-week group stress reduction program in which subjects learned, practiced, and applied “mindfulness meditation” to daily life situations. The control group received education materials and were encouraged to use community resources for stress management.

Measures: The Daily Stress Inventory assessed the effect of daily hassles, the Revised Hokins Symptom Checklist measured psychological distress, the Medical Symptom Checklist measured number of medication symptoms, and a Follow-up Questionnaire measured program adherence.

Results: Intervention subjects reported significant decreases from baseline in effect of daily hassles (24%), psychological distress (44%), and medical symptoms (46%) that were maintained at the 3-month follow-up compared to control subjects (repeated measures analysis of variance [ANOVA]; p < .05).

Williams, Norman D. Yoga meets the workplace in battle to reduce stress. The Sacramento Bee, 6 Mar 1998, Metro Final, PSA-2044, Business Section.


Abstract: Although meditation has been employed successfully as a treatment for various stress-related disorders, there is still little evidence clarifying just which aspects of meditation training are responsible for these therapeutic effects. This experiment sought to test the hypothesis that creating two opposite expectations about an initial meditation experience would result in differing physiological and phenomenological responses, even though the same technique was practiced by all subjects. The results of the experiment failed to support this hypothesis.

Wright, Jeff. Stress management. In Jeff Wright, *Dubuque Yoga*. Orlando, Fla.: Rivercross Publishing, 2000, pp. 73–75. (Contains a table comparing conventional “relaxation by distraction” with yogic “relaxation by concentration.”)


“A primary school is teaching yoga to its pupils to help calm their stress as they prepare for national curriculum tests. Children aged 10 and 11, at Heathfeld Primary School in Nottingham, are learning exercises, breathing and relaxation techniques . . . The lessons were the idea of Year 6 teacher Louise Garber, who learns yoga in her spare time . . . On a basic level, it’s a nice treat for them, and treats help motivate children. A lot of them have said they have been practicing it at
home in their spare time, so they’re taking it away with them, which is great. It is important to try to recognize we are teaching people, not little numbers with levels.”


**Of Related Interest**

**Amos, Deborah.** Straight from the heart: Controlling the heart’s rhythms can benefit the whole body. 7 Feb 2002. Boulder Creek, Calif.: ABC News.

On the HeartMath technique, which claims to work “better than yoga and meditation because it’s more long-lasting. In yoga and similar exercises, it takes some time to reach a relaxed state, and it often evaporates quickly. The HeartMath technique, on the other hand, teaches people how to get to their optimum balance point in a few minutes—sometimes people can even do it in less than a minute. It also teaches them how to sustain that point once they reach it.”


From the Health Journeys website: Track 1: Just like an oyster turns a grain of sand into a pearl, in this magical musical tale, children learn how to turn pesky thoughts into happy ones. Joyful children voices in the roles of characters teach them the art of pearling. Using song, this effective stress management technique is designed to bring children to a new level of self-acceptance. Track 2: Listening to the rhymes, rhythms and music of the ocean, children follow their breathing and become present in the moment. Learning how to watch their thoughts without becoming upset, they can redirect their attention and go below the surface to find the calm within. Track 3: Theme song: “From a Grain of Sand, I Can Make a Pearl.” Track 4: Ocean Instrumental of “Breathing Myself Happy.”


Gallois, P. [Neurophysiologic and respiratory changes during the practice of relaxation techniques]. *Encephale*, 1984, 10(3):139–144. [Article in French.]

__________, G. Forzy, and J. L. Dhont. [Hormonal changes during relaxation]. *Encephale*, 1984, 10(2):79–82. [Article in French.]


Abstract: To assess the influence of a hypnotic intervention on cellular immune function during a commonplace stressful event, the authors selected 33 medical and dental students on the basis of hypnotic susceptibility. Initial blood samples were obtained during a lower stress period, and a second sample was drawn 3 days before the first major exam of the term. Half of the participants were randomly assigned to hypnotic-relaxation training in the interval between samples. Participants in the hypnotic group were, on average, protected from the stress-related decrements that were observed in control participants’ proliferative responses to 2 mitogens, percentages of CD3+ and CD4+ T-lymphocytes, and interleukin 1 production by peripheral blood leukocytes. More frequent hypnotic-relaxation practice was associated with higher percentages of CD3+ and CD4+ T-lymphocytes. These data provide encouraging evidence that interventions may reduce the immunological dysregulation associated with acute stressors.

From an article by Reuters Health (3 Oct 2001) on this research entitled “Self-hypnosis may cut stress, boost immune system” (http://www.healthcentral.com/news/newsfulltext.cfm?ID=59539&src=n29&src=hcnewshvi): “The investigators found that during exam time, the self-hypnosis students launched stronger immune responses compared with students who did not learn the technique. And the more often students practiced the relaxation strategy, the stronger their immune response. In previous studies, Kiecolt-Glaser and her colleagues have found that stressful times may impair the body’s wound-healing process and response to vaccination. They and other researchers have also found that relaxation techniques may combat these effects by relieving stress and boosting the immune system. The authors add that some of the strongest evidence for the benefits of self-hypnosis, in particular, comes from studies of surgical patients. This work has suggested the technique can reduce patients’ pain and anxiety, shorten hospital stays and speed recovery.”


“Traumatic[stress-related] symptoms are not caused by the dangerous[stressful] event itself. They arise when residual energy from the event is not discharged from the body. This energy remains trapped in the nervous system where it can wreak havoc on our bodies and minds. Wild animals have developed the ability to shake off this excess energy. The key for humans in dispelling traumatic symptoms lies in our being able to mirror wild animals in this way. Dr. Levine offers a safe, gradual way to help trauma survivors develop their own natural ability to eliminate the excess energy caused by overwhelming events.”


In-depth discussion of stressors in the workplace and possible remedies, including Yoga and meditation.


Abstract: Until recently, claims for the psychological benefits of physical exercise have tended to precede supportive evidence. Acutely, emotional effects of exercise remain confusing, both positive and negative effects being reported. Results of cross-sectional and longitudinal studies are more consistent in indicating that aerobic exercise training has antidepressant and anxiolytic effects and protects against harmful consequences of stress. Details of each of these effects remain unclear. Antidepressant and anxiolytic effects have been demonstrated most clearly in sub-clinical disorder, and clinical applications remain to be exploited. Cross-sectional studies link exercise habits to protection from harmful effects of stress on physical and mental health, but causality is not clear. Nevertheless, the pattern of evidence suggests the theory that exercise training recruits a process which confers enduring resilience to stress. This view allows the effects of exercise to be understood in terms of existing psychobiological knowledge, and it can thereby provide the theoretical base that is needed to guide future research in this area. Clinically, exercise training continues to offer clinical psychologists a vehicle for nonspecific therapeutic social and psychological processes. It also offers a specific psychological treatment that may be particularly effective for patients for whom more conventional psychological interventions are less acceptable.


Abstract: Objective: Mental or emotional stress-induced ventricular arrhythmias and sudden cardiac death are thought to be mediated by the autonomic nervous system and ischemia. In the absence of ischemia, increased inhomogeneity of re-polarization is thought to be important. We tested the hypotheses that in the absence of ischemia, mental stress may modulate re-polarization by changing autonomic balance; and mental relaxation induced by hypnosis may offset the potentially adverse effects of stress on the cardiac electrophysiology. Methods: Twelve healthy volunteers (6 male, age 18–35, mean 25 years) experienced a series of different emotions intended to induce a wide range of autonomic response (42 test epochs) on two separate occasions, with and without hypnosis, with continuous electrocardiogram recording. Low- (LF) and HF (high-frequency) heart rate variability was measured and ventricular re-polarization was assessed using the relative T-wave residua (proportion of non-dipolar components of the T wave) calculated for the T-onset – T peak (TWR-peak T), T peak – T end (TWR-end T), and the whole T wave (TWR). Results: Emotionally induced changes in LF and LF/HF ratio correlated with changes in TWR, e.g., (R = 0.51, p < .001; R = 0.59, p < .0001; and R = 0.59, p < .0003, for LF/HF versus TWR, TWR-Peak T, and TWR-end T, respectively. Mental relaxation induced by hypnosis increased LF power (1,205 ms2) versus 624 ms2, p < .003 for hypnotized versus non-hypnotized state), HF power (1,619 ms2 versus 572 ms2), p < .0004), and reduced LF/HF ratio (1.0 versus 1.5, p = .052) and was associated with a marked reduction in the changes in re-polarization in response to emotion, e.g., 10.7 x 10–6 versus 5.0 x10–6, p < .03 for TWR. Conclusions: a) Mental stress in the absence of ischemia altered re-polarization inhomogeneity via change in the autonomic balance. b) Mental relaxation induced by hypnosis greatly reduced the effect of mental stress on re-polarization. c) These findings may have implications for arrhythmogenesis.


Abstract: The prevalence of insomnia associated with emotional stress increases markedly in middle-age. Both the top and end hormones of the hypothalamic-pituitary-adrenal axis, i.e. CRH and glucocorticoids, stimulate arousal/wakefulness and inhibit slow wave (deep) sleep in experimental animals and man. The objective of this study was to test the hypothesis that middle-age is characterized by increased sensitivity to the sleep-disturbing effects of the hypothalamic-pituitary-adrenal axis . . . We conclude that middle-aged men show increased vulnerability of sleep to stress hormones, possibly resulting in impairments in the quality of sleep during periods
of stress. We suggest that changes in sleep physiology associated with middle-age play a significant role in the marked increase of prevalence of insomnia in middle-age. [The authors recommend Yoga for stress reduction.]


**Ongoing Research and Other Projects**

**Rita Benn and Elena Gillespie**
University of Michigan Complementary and Alternative Medicine Research Center
Research project (commencement date unknown, but in progress in 2002): Social-emotional competence and stress reduction in middle school students: A pilot study. For details, see http://www.med.umich.edu/camrc/research_meditation.html.

“Several studies have elucidated the beneficial effects of meditation for stress reduction in adults and concomitant effects on physiological indices of cardiac functioning. There has been minimal research, however, on the impact of this technique in school age populations. This study provides the unique opportunity to investigate how one form of meditation, Transcendental Meditation (TM), may affect student well-being, stress and overall level of social-emotional competence.

“As part of a charter school curriculum, teachers as well as sixth grade students have been instructed in meditation at the beginning of the school year, and continue to practice TM together twice during the school day. Self-report data on standardized behavioral measures will be provided by middle school youth who have practiced TM over the past year and by a comparable control group of middle school children who have not been exposed to this practice. In addition, this study will explore whether there are any immediate effects on the experience of children’s emotions after they practice TM. The results of this study will be used to determine the need for a longitudinal and/or prospective randomized research study in this area.”

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**Roosevelt University Stress Institute Large Scale Relaxation Project**
430 S. Michigan Ave.
Chicago, IL 60605
http://www.roosevelt.edu/academics/cas/sp/stressinstitute.htm
“For the past decade an international team of Institute researchers have studied over 10,000 practitioners of all major approaches to professional and causal relaxation. The discoveries of this project challenge the traditional world view that all relaxation approaches have the same effect and are equally effective at reducing stress. Different types of relaxation have different effects and work for different people. For this reason, the Stress Institute believes that to be competent in relaxation, one must be proficient in the full array of available relaxation techniques and strategies. [The Institute’s] ABC Relaxation Training integrates the major recognized approaches to professional self-relaxation: progressive muscle relaxation, autogenic training, yoga, breathing exercises, imagery, and eight forms of meditation.”

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November 2000: Working on a term paper at Keller Graduate School of Management for a master’s degree in human resource management that will incorporate the application of Yoga to stress.