

HEALTH AND STRESS

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REDUCING STRESS WITH YOGA, PILATES & TAI CHI

KEYWORDS: *Asana*, Lotus Position, Hatha, Iyengar, Bikram, *Ashtanga (Vinyasa)* Kundalini, Integral, Forrest, Sivananda & Anusara Yoga Styles, Sun Salutations, *Om*, Madonna, Heart Rate Variability, *Qigong*, *Kung Fu*

Ancient scriptures and archeological findings indicate that Yoga has been practiced in various forms for over 5,000 years. It seems doubtful that it would have persisted over this lengthy period of time if it did not provide significant benefits that were not placebo effects. Although the same holds true for acupuncture, which has a similar lengthy history, these and other Eastern practices like meditation have not been widely accepted by Western medicine. One explanation may be an inability to understand how they work because of confusing concepts and terms that are difficult to fit into our framework of what causes disease or promotes health. Another is the lack of any financial incentive for physicians to implement or recommend them.

Some of this resistance has started to disappear. This became evident at the "Health and Longevity" conference sponsored by the Columbia Integrative Medicine Program and Tibet House U.S. a few months ago that concluded with an overview by the Dalai Lama. It was designed to demonstrate how traditional Indo-Tibetan practices to promote healthy aging are being increasingly validated by sophisticated imaging procedures in addition to stem cell, telomerase, heart rate variability and other cutting edge research studies. As outlined in a recent Newsletter, presentations on these topics by a distinguished faculty were responded to by Indo-Tibetan medicine authorities, physicians and other practitioners who explained how they dovetailed with traditional techniques whose health enhancement and stress reduction rewards have been acknowledged for centuries.

With respect to healthy aging, Benjamin Franklin noted, **"All would live long, but none would be old"**. Living long but not growing old might sound like an oxymoron, but biological and chronological aging can be quite different depending on genetic, environmental and lifestyle

influences, especially stress. As emphasized in a prior Newsletter, stress can accelerate the appearance of many markers of biologic aging through varied mechanisms. Indeed, in an attempt to explain the relevance of his animal research to humans, Hans Selye later redefined stress as "the rate of wear and tear on the body", which is actually

ALSO INCLUDED IN THIS ISSUE

- Exactly What Is Yoga? Are Its Rewards Related To Religion Or Faith?
- The Health Benefits Of Yoga And How Yoga Differs From Pilates And Tai Chi

a pretty accurate description of biological aging. Conversely, developing effective stress coping strategies can delay certain clinical manifestations of aging.

There can be little doubt about the remarkable resurgence of public interest in the stress reduction and other benefits of yoga. A recent study sponsored by *Yoga Journal Magazine* reported that **Americans spend \$2.95 billion/year on yoga classes and related products.** A National Institutes of Health survey found that **25 million people said they intended to try yoga within the next year.** According to a November 18 *New York Times* article, **the number of Americans practicing yoga and Tai Chi almost doubled from 7.4 million in 2000 to 14.7 million in 2005.** "While less than a decade ago, yoga and Pilates classes may have been considered alternative-lifestyle activities, they have since become as commonplace as a run in the neighborhood or a workout at the gym." A former assistant district attorney in Queens who now owns a yoga facility in Armonk, New York explained that yoga attracted people who wanted to exercise more but not at a gym. "So many people are looking for yoga in their lives because it's got the balance of being able to bring mind, body and spirit into one practice. Traditional exercise doesn't necessarily have that. You're staring at a television, running in circles while pounding your feet in place on an elliptical trainer or a treadmill." Another former commodity and stock trader had used yoga to reduce the stress and high blood pressure from his job and he and his wife now own a Yoga and Wellness Center in Darien, CT where he teaches a yoga class just for men.

Attempts have also been made to increase the integration of yoga and other time-honored Eastern techniques into conventional medical treatment programs. Part of the problem in gaining greater acceptance is confusion about how the varied types of yoga, meditation, acupuncture and yogic diets differ, and how each of these allegedly provides benefits despite such differences. Another major difficulty for physicians is the lack of reimbursement by HMO's and other fiscal intermediaries because what we call **"health insurance" is a misleading double misnomer. What we really have is a "sickness cure" system with relatively little emphasis on disease prevention or health promotion.** The result has been a disaster, as evidenced by the current epidemic of obesity and adult onset diabetes that has now spread to children. In contrast, ancient Chinese physicians got paid for keeping their patients well by preventing illness and enhancing health.

Another hindrance to greater acceptance and implementation is the bewildering assortment of strange names and terms used to describe various components of yoga and other Eastern approaches. That's not surprising in view of the numerous modifications and refinements that have been made over the past two centuries based on personal experiences and different theories on how yoga can be improved. While it is not possible to review these in detail, the following overview may be helpful in explaining the distinctions between different types of yoga as well as some of its strange terminology and in providing answers to some frequently asked questions.

Exactly What Is Yoga? Are Its Rewards Related To Religion Or Faith?

Yoga is derived from the Sanskrit root *yuj* (to yoke or bring together) and its purpose is to bring together mind, body and soul to attain a state of spiritual enlightenment and inner peace. The four main paths to achieve this goal are: *Karma Yoga* (yoga of Action), *Jnana Yoga* (yoga of Knowledge), *Bhakti Yoga* (yoga of Devotion), and *Raja Yoga* (yoga of Meditation) but each includes aspects of the others. These four paths are primarily practiced in India where yoga originated and has continued to be developed. In Western countries, yoga is generally associated with Hatha yoga, a form of *Raja Yoga* that has a particular emphasis on physical postures.

Like religion, yoga also strives for a greater union of the soul (*atma*) with the Universal Soul (*Paramatma*), such as the Judeo-Christian communion of a human being with God. Yoga is a component of Hinduism and Buddhism and although it has influenced other religious and spiritual practices as a means to enlightenment it is no longer limited to any particular region or religion. **Yoga is primarily a practical technique to promote spiritual growth and reduce stress for anyone that seems to work whether or not you believe in its efficacy.** Many popular stress reduction techniques such as meditation, mental imagery, controlled breathing, stretching and other exercises are actually derived from yoga, which has been described as "the technology of ecstasy". Ecstasy refers to the enlightenment that can be achieved through proper yoga practices and the technology consists of controlling the rate and depth of breathing (*pranayama*) while simultaneously stretching the body to form different poses (*asanas*) that facilitate the focused concentration required to attain the rewards of deep meditative states.

Asana is a Sanskrit word meaning a comfortable and stable posture. Many *asanas* are designed to reduce physical distractions that interfere with the ability to concentrate in order to obtain a deep meditative state. Others are used to improve flexibility and muscle tone. Well over 100 *asanas* have evolved as the result of thousands of years of carefully observing their effects. As shown to the right, an *asana* or pose may be named for a flower (lotus), bird (crane), tool (plow), body shape (triangle), animal (lion) or its inventor. Each reflects a physical or psychological influence that the pose is thought to have on a person. Not shown are a snake *asana* that makes the spine flexible and a frog *asana* to help the body conserve energy and use less food, much like frogs do during their winter hibernation.

Some yoga styles emphasize deep relaxation with each pose and have a more spiritual focus. Others move through specific poses very quickly much like an aerobic workout. Yoga should not be confused with calisthenics or exercises that help to strengthen and develop muscles. Practicing certain *asanas* in special sequences not only provides similar musculo-skeletal improvements but adherents also believe that they can strengthen, purify and balance the endocrine, nervous and circulatory systems.



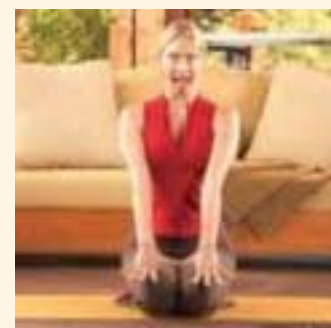
Flying Crane Yoga Pose



The Plow Yoga Pose



Triangle Yoga Poses



Simhayana Lion Pose

The lotus position (Sanskrit: *Padmasanam*) shown at the left is a cross-legged sitting posture with a straight spine in which the right foot is placed on the left thigh and the left foot on the right thigh with the soles of the feet turned up. This position is said to resemble a lotus and to promote proper breathing and physical stability that will facilitate meditation. It is probably the most familiar yoga pose because both Shiva, the meditating god of Hinduism (sometimes shown as half female) and Buddha, the founder of Buddhism, are so frequently depicted in the Lotus position, as illustrated below.



Padmasanam Lotus Position



Shiva Statue In Bangalore



Buddha With A Lotus Blossom

There are numerous differing types of yoga practices, many of which also have their own variations based on goals, physical requirements, environmental influences and other factors. Several have strange names indicating who originated a particular procedure or made a significant change to it centuries ago. Others use obscure Sanskrit terms for various components that often add to the confusion of selecting what might be best for you. Some of the most common types come under the general headings of:

HATHA YOGA – Hatha yoga (worshipful poses) was introduced by the 15th century Indian sage Yogi Swatmarama. However, there have been so many variations since then that hatha has become an umbrella term to describe predominantly physical types of yoga that have more of an emphasis on basic *asanas* than breathing exercises and meditation. Its primary purpose is to prepare and condition the body using particular poses to reduce physical distractions that often interfere with the ability to concentrate on meditating. Hatha yoga tends to be slow-paced and not overly strenuous and is generally no longer widely practiced in India because it is viewed as a more tiresome and roundabout way to achieve spiritual enlightenment compared to other techniques. It is most popular in Western countries where it is used so frequently as an introduction to yoga that hatha has also become a synonym for classes for beginners.

IYENGAR YOGA – This is a form of hatha yoga developed by B.K.S. Iyengar who started to practice yoga in an effort to improve his health while recovering from tuberculosis. He later began teaching yoga in 1936 with a focus on the importance of bodily alignment. In yoga, alignment refers to the precise way the body should be aligned in each pose to obtain its maximum benefits and reduce injury. Iyengar yoga emphasizes holding poses over longer time periods rather than quickly moving or flowing from one pose to the next so that it does not require unusual physical agility and can be practiced by almost anyone. Adherents claim it is a very effective stress reduction technique and props such as bolsters, blankets, straps or blocks are frequently used to promote relaxation or to bring the body into more proper alignment. Because of this, it is not considered to be one of the classical types of yoga and has no Sanskrit name but is often referred to as Restorative yoga.

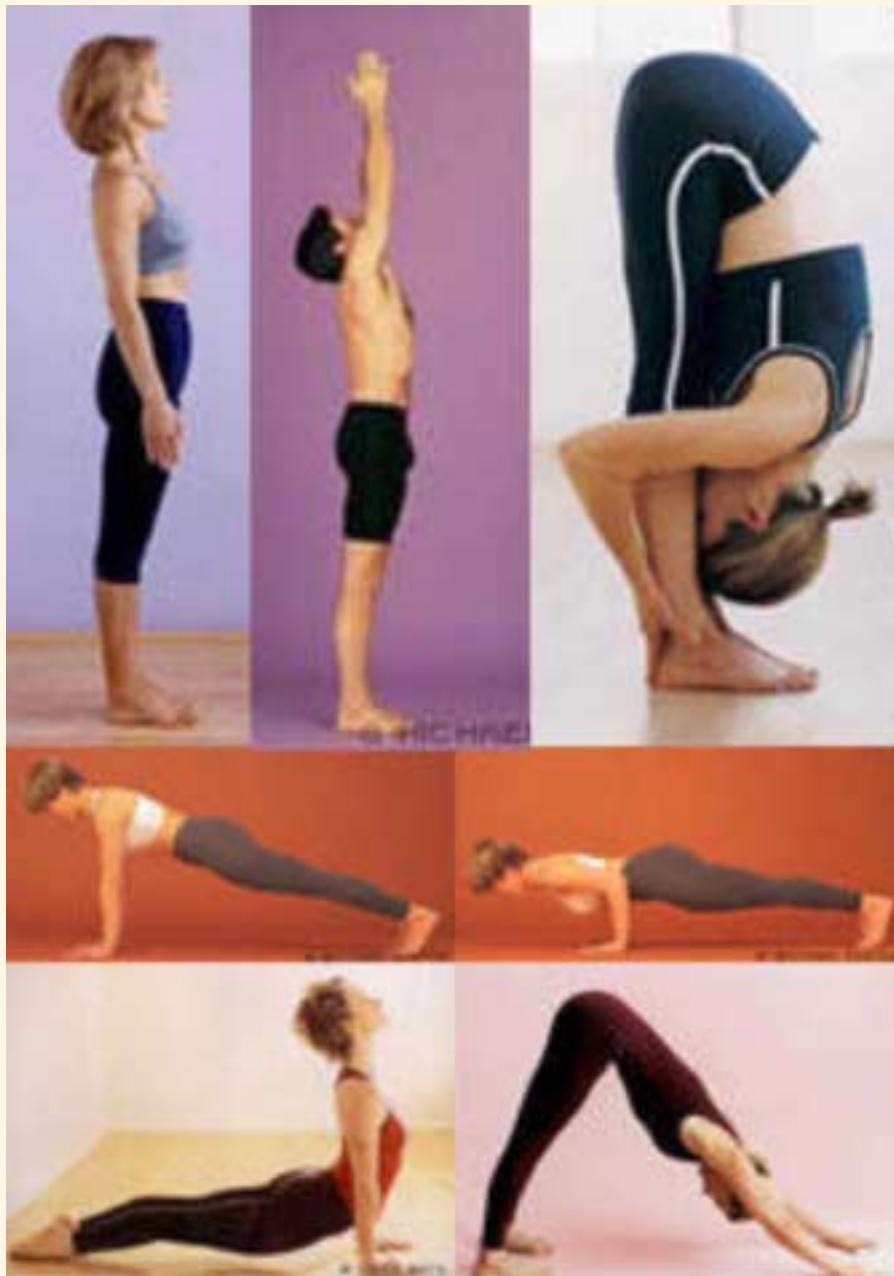
BIKRAM YOGA - This is another modification of hatha yoga developed by Bikram Choudhury, who started doing yoga at the age of four under the tutelage of Bishnu Ghosh, a renowned physical fitness authority. He continued to practice yoga for five to six hours a day at Ghosh's College of Physical Education in Calcutta and won the National Indian Yoga Championship when he was 13. He was undefeated for the following three years but then injured his knee during a weight lifting accident and was told by leading European doctors that he would never walk again. He was carried back to the Ghosh College in Calcutta where he followed a series of special exercises and after six months had completely recovered. Because of this phenomenal result he started several yoga schools in India that were so successful that he promptly started two more in Japan. Bikram's big break came in 1972 when he was summoned to the South Pacific to treat President Nixon whose activities had been significantly curtailed by an attack of phlebitis. As detailed in a *60 Minutes* interview, after one treatment session, Nixon got dressed and continued with his grueling schedule without any further complaints and was so pleased that he extended an open invitation for Bikram to come to the U.S. The rest is history. Bikram set up his World Headquarters in Los Angeles, where his clients have included Quincy Jones, Michael Jackson, Candice Bergen, Brooke Shields and numerous other Hollywood celebrities. He subsequently franchised his yoga program, charging \$5,000 to certify an instructor with additional sums for periodic refresher courses. There are now Bikram Yoga studios in all major U.S. cities (including 8 in San Francisco and 9 in Manhattan) and well over 1200 around the world in every continent, earning his program the nickname of McYoga. As also explained in the *60 Minutes* interview, he has copyrighted his procedure and has successfully defended challenges to this in court to insure that all students get the same treatment at any studio with the Bikram name. As a result of this and his line of yoga clothing and accessories, he has become one of the richest multimillionaires in this \$3 billion/year yoga industry.

All of this seems quite amazing, since by Bikram's own admission, going through his treatment program is like being in a "torture chamber". It consists of a series of 26 special *asanas* or postures and two "80-20" breathing exercises practiced over a 90-minute period in a room heated to 105 degrees under the direction of a certified instructor who provides accompanying dialogue. Bikram believes that the heat makes muscles more flexible so they can be stretched to a greater degree, if there is no pain there is no gain, that true meditation starts from without rather than from within and that his technique "opens the brain to the mind". Millions of people apparently agree since Bikram studios are continuing to open up around the world and at least 2 research studies are under way at leading universities to demonstrate how Bikram yoga can increase bone density and provide other benefits. Bikram may be his own best advertisement since he appears to have changed very little and to have the same vitality he exhibited 20 years ago. To learn more, go to www.bikramyoga.com where you can see a fascinating videotape of the *60 Minutes* interview demonstrating this and his technique, which is also known as Hot yoga.

ASHTANGA (VINYASA) YOGA – *Ashtanga* yoga is described in ancient manuscripts and has been progressively modified since then. It is much more complicated than other popular practices and can be confusing because of the Sanskrit terms used to describe its various components. *Ashtanga* (meaning 8 limbs) consists of the following eight spiritual practices:

1. *Yama* [moral codes]
2. *Niyama* [self-purification and study]
3. *Asana* [posture]
4. *Pranayama* [breath control]
5. *Pratyahara* [sense control]
6. *Dharana* [concentration]
7. *Dhyana* [meditation]
8. *Samadhi* [contemplation]

The main difference between *Ashtanga* and other types of yoga is the emphasis on *vinyasa* (the intelligent putting together of things). *Ashtanga* yoga is a very energetic and aerobic practice sometimes referred to as Power yoga that was originally intended for teenage boys but has subsequently been modified so that it can be utilized by people of all ages, including pregnant women. Its main component is a sequence of Sun Salutation *asanas* called *Surya-Namaskar*. *Surya* is Sanskrit for sun and *Namaskar* is a Hindi word meaning salutation, salute, greeting or praise. Traditional *Ashtanga* consists of 12 specific consecutive *asana* poses that are performed in a graceful fashion so that each appears to flow into the next one. This sequence is often repeated several times. Numerous variations have been developed by adding or substituting other *asanas* and depending on personal preferences, there may be only 7 or 8 of these postures in the sequence. Some of the most popular and their names are shown below.



Some *Surya-Namaskar* (Sun Salutation) *Asanas*

From left to right in descending order: *Tadasana* (mountain pose), *Urdhva Hastasana* (upward hand pose), *Uttanasana* (standing forward bend), plank pose, *Chaturanga Dandasana* (four limbed pose), *Bhujangasana* (cobra) similar to *Urdhva Mukha Svanasana* (upward facing dog) pose, inverted V pose.

However, this *asana* sequence is much more complicated than simply moving from one pose to the next. Each movement must be coordinated with *ujjay*, (ocean breathing pattern) so that you inhale as you extend or stretch and exhale while folding and contracting. And that's just the beginning, since there are also *bhandas* (internal body locks) *drishtis* (gazes) and *mantras*. A *bhanda* is a sustained contraction of a group of muscles that not only assists in retaining a pose but also moving in and out of it. The *mula bandha* is performed by tightening the muscles in the lower pelvic area, the *udiyana bandha* is a contraction of the abdominal muscles that attempt to bring the navel to the base of the spine and the *jalandhara bandha* (throat lock) is accomplished by lowering the chin slightly while raising the sternum and the palate so that the gaze focuses on the tip of the nose. *Bhandas* are often used to develop different parts of the body and when practiced together, the three locks are known as *Maha Bandha*, the great lock. In addition to the three *bhandas*, there are nine *drishtis* that direct the gaze to specific locations such as *nasagrai* (a point six inches from the tip of the nose), *broomadhya* (to the third eye or between the eyebrows) and *nabichakra* (to the navel). Each *asana* is associated with a different *drishti*. For example, in the Downward Facing Dog pose (*Adho Muhka Svanasana*) the *drishti* is directed to the navel.

Mantra is a Sanskrit word meaning "instrument of thought" and is usually a religious syllable, phrase or short poem that helps to promote concentration during meditation. The *Ashtanga* practice is traditionally started with the following mantra:

*vande gurunam charanaravinde sandarshita svatma sukhava bodhe
nir shreyase jangalikayamane samsara halahala mohasantyai
abahu purusharakam sankhachakrasi dharinam
sahasra shirsam svetam pranamami patanjalinam*

It closes with another mantra that can be equally difficult to master if you are not familiar with Sanskrit. As a result, both are sometimes replaced by chanting "Om" at the start and finish of a yoga session. Chanting is the process of repeating a mantra in rhythmic fashion with precise pronunciation to take advantage of the vibrational effects of the sounds that are produced. Despite its simplicity, *Om* has a complex meaning since it signifies the whole universe coalesced into a single sound and represents the union of mind, body, and spirit that is at the heart of yoga. When chanted, the sound should consist of three syllables - a, u, and m that are pronounced *aaaaauuuuummmmm*. *Om* became a common mantra in the 1960's when the Beatles practiced Transcendental Meditation, a movement founded by Maharishi Mahesh Yogi, and a decade later when Herbert Benson introduced his Relaxation Response, both of which are still popular.

Om is actually the beginning of the mantra *Om mani padme hum*, which is helpful in understanding why it embraces or reflects the basic tenets of yoga. According to the Dalai Lama, these six syllables "symbolize the practitioner's impure body, speech and mind" that practicing yoga is designed to correct. As he explained in one of his discourses, *mani*, meaning jewel, symbolizes love, compassion and the altruistic intention to become enlightened, *padme*, meaning lotus, symbolizes wisdom and *hum* is the seed syllable of *Akshobhya* - the immovable, the unfluctuating, that which cannot be disturbed by anything. While chanting *Om mani padme hum* or even *Om*, one must dwell on its great and vast meaning, which has only been summarized in the above description.

Due to the efforts of Sri K. Pattabhi Jois, *Ashtanga* yoga has also spread from India to all parts of the world, particularly the U.S., where it is practiced by and has been popularized by celebrities like Sting and Madonna. As Madonna explained, "When I was pregnant, I began doing *Hatha* yoga, and then began doing the more difficult *Ashtanga* yoga after I had the baby, because I wanted to do something more visceral and physical." She became particularly adept and in *The Next Best Thing*, a movie about a forty-year old Yoga teacher, she accurately demonstrates a series of difficult *Ashtanga* poses with a proficiency usually

seen only in professional instructors. The movie's credits thank Sri K Pattabhi Jois "for illuminating the teaching of yoga". Madonna said that what impressed her most about Jois was his simplicity and rigorous demands. He taught yoga primarily in India and "was never tempted to rush to Hollywood to make the big bucks."

Other types of yoga targeted to different audiences have also been introduced in the U.S. over the past few decades. Some the most popular include:

KUNDALINI - Kundalini yoga was introduced in the U. S. in 1969 and is practiced primarily in California. *Kundalini* (Sanskrit for "coiled one" and often depicted as a three and a half coiled snake) is a dormant energy that is believed to be located at the base of the spine, ready to be released. The emphasis therefore is on breathing patterns that are coordinated with physical movement in an attempt to free energy in the lower body so that it can move upwards. All *asana* practices make use of *pranayama* (breath control), but in Kundalini yoga, the effects of the breath (also called *prana*, meaning energy) on these postures is essential. To facilitate this upward flow of energy, this technique utilizes rapid, repetitive movements rather than holding poses for a long time and instructors often lead the class in call and response chanting.

INTEGRAL - Integral yoga follows the teachings of Sri Swami Sachidananda, who came to the U.S. in the 1960s and later founded many Integral Yoga Institutes and the famed Yogaville Ashram in Virginia. Integral is a fairly gentle practice, and classes often also include breathing exercises, chanting, meditation and *kriyas*. *Kriyas* are movements, vocalizations or actions like twitching, and shaking or chanting that help to move energy during Kundalini. One analogy is to think about a coiled up or kinked garden hose. When the water is turned on, the hose thrashes around until the water pressure (energy of *Kundalini*) causes it to straighten so the water can flow freely.

FORREST - Forrest yoga taught by Anna Forrest in California focuses on performing vigorous *asana* sequences that are designed to cleanse and strengthen the body and release pent-up emotions and pain to promote healing. It is a fairly intense workout with an emphasis on abdominal strengthening and deep breathing.

SIVANANDA - Sivananda yoga is named after Swami Sivananda Saraswati. The first Sivananda yoga center in the U.S. was founded in 1957 and there are now several in North America as well as around the world. In addition to conventional *asanas*, and meditative practices it provides specific exercises to treat neck, back and other muscle complaints. It also emphasizes the importance of eating to live rather than living to eat by following a primarily vegetarian diet.

ANUSARA - Anusara yoga was founded in the U.S. by John Friend less than ten years ago and has become one of the fastest growing yoga styles in the world with over 1200 affiliated teachers and 100,000 students world-wide. It combines a strong emphasis on physical alignment with a positive philosophy that looks for the good in all people and all things. *Asanas* that are not strenuous postures are favored so that the program can be accessible to people with different abilities. Classes are usually taught in a light-hearted fashion with experienced instructors acting as if they are part of the fun-loving class rather than being aloof or dictatorial. This community of spirit seems to be responsible for the rapid popularity of Anusara, which has been described as having "the tightness of a family, yet the looseness of a merry band of Bohemian artists."

The Health Benefits Of Yoga And How Yoga Differs From Pilates & Tai Chi

There is little doubt that yoga can be helpful in reducing or preventing many emotional and somatic stress related complaints. Some of these and other health benefits include:

- Improvement in feelings of anxiety and depression
- Better sleeping habits
- Relief of allergy and asthma symptoms
- Reduction in the frequency and severity of migraine and tension headaches
- Lower blood pressure and heart rate
- Lessening low back pain
- Greater sense of well-being
- Assisting in smoking cessation efforts
- Facilitating spiritual growth
- Promoting weight loss
- Increased strength and flexibility
- Slowing down the aging process

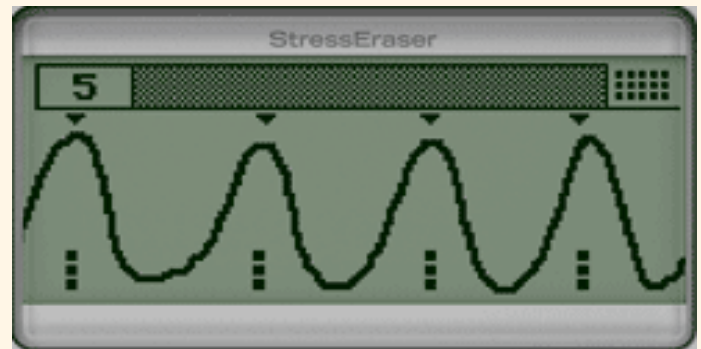
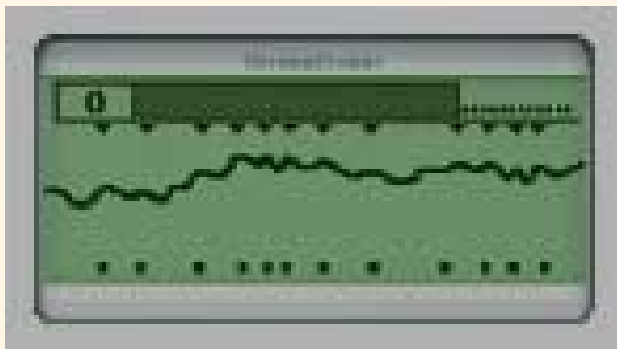
Support for these claims comes from several recent medical reports. According to *Relief is in the Stretch: End Low Back Pain Through Yoga* published in 2005, yoga increases the range of motion in your hips, which can reduce low back pain. This was subsequently confirmed in a study of women aged 44 to 62 presented at the American College of Sports Medicine's annual meeting showing that yoga increased lower-back flexibility and diminished pain. Researchers from the Yale University School of Medicine found that practicing yoga for an hour and a half three times a week could quickly improve cardiovascular function. They recently reported that 33 men and women who followed this regimen for just six weeks significantly lowered blood pressure and improved the ability of their blood vessels to expand by 17 percent when subjected to standard challenges. As the lead author of the study explained, "How well the blood vessels dilate is a good indication of how healthy the heart is." He attributes the improvement to the stress-reducing benefits of yoga.

Although the mechanism of action is not clear, two studies show that yoga also helps to shed extra pounds and to keep them off. Researchers at the Fred Hutchinson Cancer Research Center in Seattle who followed over 15,000 adults reported that those who didn't practice yoga gained about 18.5 pounds more over a 10-year period than those who had practiced for at least four years. Another study from the Preventive Medicine Research Institute in Sausalito found that people who practiced yoga and meditation regularly, exercised and watched their diet, lost more weight than those who exercised and ate a similar diet but skipped yoga. A recent publication from the division of Sleep Medicine at Harvard Medical School reported that a half-hour to 45 minutes of daily yoga practice markedly improved the sleeping habits of insomniacs, especially those with high levels of mental and emotional arousal who had difficulty falling asleep. Total sleep time was increased by over 12 percent. An article from the department of Psychiatry at New York Medical College published in April found that yogic breathing techniques were effective in alleviating the symptoms of patients with severe anxiety and depression. These benefits were attributed to the stress reduction effects of yoga that lower heart rate and other sympathetic nervous system responses. University of Texas M.D. Anderson Cancer Center researchers reported that twice a week yoga classes significantly reduced the fatigue and other side effects of six weeks of radiation therapy in women who had undergone surgery for breast cancer. Simple yoga and other meditative practices are increasingly being introduced into elementary schools and kids report that this makes them feel more energized and focused. One teacher commented that it was not only amazing how much they enjoyed it but that he had seen some studies suggesting that it improved attention deficit disorder and lowered drug requirements.

Some of yoga's benefits are undoubtedly due to its ability to facilitate meditation, which has been shown in numerous studies to lower blood pressure. It may be particularly effective in treating hypertension, which is often stress related, and may also help to prevent coronary heart disease. A study in the June issue of *Archives of Internal Medicine* of over 100

patients with coronary disease found that meditation for a period of 16 weeks not only reduced blood pressure but also insulin resistance, which is associated with increased risk for diabetes, metabolic syndrome and heart failure.

What was intriguing about this study was the observation that this amount of meditation improved heart rate variability, the most accurate way to objectively measure stress. As indicated in previous Newsletters, diminished heart rate variability significantly predicts the likelihood of sudden death. More importantly, the recent availability of relatively inexpensive hand held devices to display heart rate variability in real time may provide a method of preventing this and other stress related diseases.



The illustration above (left) shows the cardiovascular response to stress represented by small jagged waves and scattered blocks indicating decreased heart rate variability due to sympathetic nervous system stimulation. Compare this to the illustration on the right showing how practicing slow and paced rhythmic respiration produces smooth waves containing evenly aligned blocks indicating increased heart rate variability due to parasympathetic stimulation.

Stress is associated with an increase in sympathetic nervous system activity that increases heart rate and blood pressure. Meditation blocks this primarily because its associated regular respiratory pattern stimulates parasympathetic responses that blunt these potentially harmful cardiovascular effects. There is some suggestion that experiencing feelings of love and appreciation that are often engendered during deep meditation may potentiate these restorative responses. However, similar benefits may be provided by learning proper breathing techniques using StressEraser and other real time feedback devices like emWave and RespeRate. Wild Divine also incorporates heart rate variability as well as skin conductance feedback in its stress reduction program that emphasizes Eastern practices. Their web site states, **"According to the Centers for Disease Control and Prevention, up to 90 percent of the doctor visits in the USA may be triggered by a stress-related illness."**

Pilates is a physical fitness system that was developed in the early 20th century by Joseph Pilates. **The rapid growth of Pilates is even more impressive than yoga's, with more than 10.4 million participants last year compared to 1.7 million in 2000.** Originally called *Contrology*, Pilates is primarily an exercise program that focuses on controlling the muscles providing spinal support. These exercises strengthen the deep torso muscles to improve alignment of the spine and are helpful in preventing and alleviating low back pain. Like yoga, the Pilates method also teaches breath awareness and concentration that enhance its stress reduction benefits but it has less of the spiritual and meditative components associated with yoga. Pilates appeals to women, possibly because the low impact exercises have more of an emphasis on stretching and are not as physically demanding or time consuming. Practicing both has also become popular and combination yoga and pilates classes are increasingly popping up.

Tai Chi is a similar system of movements and positions believed to have originated in 12th-century China and later developed into a form of martial art. The modern practice referred to here often includes sequences of slow movements coordinated with deep breathing and concentration that has been described as "moving meditation". Classes usually include less than 20 pupils who are taught movements to help them keep their bodies stable and upright while shifting weight by using specific poses that can last for 5 minutes or much longer. After these are mastered, *Tai chi* can be practiced alone and has been shown to promote flexibility and balance control that reduces the risk of falls and fractures in the elderly. *Tai chi* also improves cardiovascular fitness since its low impact movements surprisingly burn more calories than surfing and nearly as many as downhill skiing. Additional benefits include reducing anxiety and depression, symptoms of Attention Deficit and Hyperactivity Disorder in children and boosting immune system function.

Qigong also originated in China as a martial art over 3,000 years ago but is now used mainly to promote health and for other medical purposes. *Qi* means breath or gas and in Mandarin Chinese, this refers to the energy produced by breathing that sustains life. *Gong* means work or technique so that *Qigong* is "breath work" or the art of managing breath and cultivating energy to achieve good health, much like *pranayama* in Yoga. There are over three thousand types of *Qigong* practices that can be classified as being primarily internal or external. Internal *Qigong* uses breathing control, movement and meditation whereas external *Qigong* (also known as *Qi* emission) is performed by a master by placing his hands on a patient to project *Qi* energy for the purpose of healing. (This is somewhat related to *Kung Fu*, a martial art famous for demonstrations of practitioners breaking books with bare hands.) *Qigong* treatment has been officially recognized as a standard medical technique in Chinese hospitals for decades and is now included in the curriculum of major medical schools and universities, some of which issue a Bachelor's and Master's degree in *Qigong* therapy.

Getting back to healthy aging, support for the benefits of the breathing and meditative practices of yoga and some of the other Eastern techniques described are supported by Massachusetts General Hospital researchers. They recently reported that the brain MRIs of 20 meditators who focused on their breathing patterns for 40 minutes a day showed much more thickness in the prefrontal cortex and other areas associated with attention and sensory processing than non-meditating controls. In addition, older participants exhibited the most between-group differences in pre-cortical thickness, suggesting that these practices help to slow down age related deterioration. Meditation has been shown to produce EEG changes consistent with a state of deep relaxation and possibly increased creativity. **This latest report reveals that in addition to improving brain function, there are also beneficial physical changes in the cerebral cortex.** As initially indicated, newer sophisticated imaging techniques and other cutting edge research procedures promise to uncover additional unsuspected benefits for yoga, meditation, breath control and other traditional Eastern practices. There is also increased interest in Chinese herbal medicines used to treat cancer and infections that have now been shown to improve immune system function. Novartis just announced it will invest \$100 million to establish a center in Shanghai to identify and develop these and other ancient remedies that appear to have considerable clinical potential.

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