

HEALTH AND STRESS

The Newsletter of The American Institute of Stress

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STRESS AND AGING

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Everyone wants to live as long as they possibly can — but at the same time, nobody wants to grow old. Does biological aging necessarily accompany chronologic aging at a similar rate of progression? It's obviously not possible to slow down the passage of time. However, strategies may be available to retard certain psychological and physiological hallmarks of biologic aging and senescence. One of the most important appears to be reducing stress. In order to investigate this, it is first necessary to define exactly what is meant by biologic aging. There is also the problem of defining stress.

This is much more difficult than it might appear, since there are numerous physical, physiologic, psychologic, and cognitive changes that can be associated with old age. Consequently, there are many different types of measurements that can be utilized to assess biologic aging, as noted below.

Physical And Physiologic Changes Associated With Aging

- Decreased kidney function.
- Decreased liver function.
- Decreased lung function.
- Decreased elasticity of blood vessels.
- Increased blood pressure.
- Decreased cardiac output and poorer circulation.
- Skin becomes drier, more wrinkled, keratotic.
- Progressive graying and loss of hair.
- Loss of muscle mass and strength.
- Increased osteoporosis.
- Increased osteoarthritis and calcium deposits in tissues.
- Increased atherosclerosis.
- Slower reaction time.
- Loss of hearing, especially for higher frequencies.
- Loss of sense of taste and smell.
- Diminished visual acuity due to cataracts, macular degeneration, etc.
- Declining levels of melatonin, DHEA, male and female hormones.
- Impaired immune system responses.
- Atrophy or hyperplasia of cells.
- Intracellular accumulation of specific pigments.
- Amyloid, calcium, immune complex deposits.

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HEALTH AND STRESS

*The Newsletter of
The American Institute of Stress*

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Glasses, hearing aids, hormonal supplements, medications and surgical procedures can alleviate many of these. Managing the non-physical problems noted below is much more challenging.

Cognitive And Emotional Changes Associated With Aging

- Loss of recall for recent events, but improved long term memory.
- Poorer personal hygiene habits and sanitary standards.
- Lack of attention to appearance and cleanliness.
- Progressive loss of a sense of independence and control.
- Easy fatigability, lack of pep, energy, and "get up and go".
- Increased anxiety and concerns about the likelihood of future health problems, financial insecurity, and having fewer friends.
- A more conservative attitude about events and people.
- Feelings of loss of attractiveness.
- Increased feelings of loneliness, and social isolation.
- A tendency towards paranoia, depression, and emotional instability.

The problem is that all of the above differ for each of us with respect to when or whether they will occur. There is also no prescribed pattern for their order of appearance. People can turn gray or start to develop

cataracts when they are thirty, but retain most of their teeth well into their nineties. Similarly, some centenarians remain bright and alert although crippled with the physical ravages of aging, while senile dementia can strike otherwise healthy individuals in their forties. Many of these manifestations of aging may be predetermined by genetic influences, while others are influenced by environmental factors. All of these variables makes it extremely difficult to determine the efficacy of any intervention.

Defining And Measuring Stress

Trying to define, much less measure stress, is even more difficult. Hans Selye, who coined the term, struggled his entire life to solve this dilemma. His original definition was "the non-specific response of the body to any demand for change", which was not really very useful. Countless others have tried to come up with something more meaningful, but after more than 45 years in the field, I can attest to the fact that trying to define stress objectively, is like trying to nail a piece of jelly to a tree. The term is ambiguous, since it is used indiscriminately to refer to noxious stimuli, the response of the body to such challenges, as well as their physical and emotional consequences. Stress is also paradoxical, since it can be good or bad. In addition, it is a highly individualized phenomenon that differs for each of us. Things that are terrifyingly distressful for some people, can be an exhilarating thrill for others, or seemingly have little emotional repercussions. This can be readily illustrated by observing passengers on a steep roller coaster ride. Thus, as Selye was fond of saying, "stress can be one man's meat and another's poison, the spice of life, or the kiss of death".

Acute, life threatening stresses elicit "fight or flight" autonomic nervous system and hormonal reactions that can have profound cardiovascular effects, including sudden death. However, this is quite different than responses to the stress of chronic loneliness and frustration, which impact more on the immune system, and increase susceptibility to infections and malignancies. Physical stress and pain evoke neuroendocrine and psychophysiologic activities quite different than those resulting from psychological and emotional distress.

Nevertheless, despite such drawbacks and difficulties, it seems quite clear that stress accelerates the aging process. More importantly, there is growing evidence that stress reduction strategies may be effective in slowing down the progression of many of the manifestations of aging. In his later years, in attempting

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to explain the significance of his research in books for the public, Selye redefined stress as "the rate of wear and tear on the body" - which is actually a pretty good description of biologic aging.

How Long Can We Live?

An ancient Sumerian legend states that the God-King Larke lived to be 28,800 years old. According to the Old Testament, Adam had Seth at the age of 130, and additional children over the next 800 years. Seth was 105 when Enosh was born, had children after that, and lived to be 912. The next five generations, Kenan, Mahalalel, Jared, Enoch, and Methuselah, had similar fertility and longevity records. Methuselah lived to be 969 and had Lamech when he was 187, who had Noah at the age of 182, and lived another 595 years, during which he sired more children. Noah was allegedly over 500 years old when Shem, Ham and Japheth were born. And "Moses was an hundred and twenty years old when he died: his eye was not dim, nor his natural force abated." The oldest existing written record of medicine, *The Yellow Emperor's Canon Of Internal Medicine* (circa 4000 B.C.), indicates that in still earlier times, people regularly lived to be over 100.

Although such anecdotal reports seem grossly exaggerated and hard to swallow, there is more reliable evidence that some people do lead very long and productive lives. Among the 5th and 6th century B.C. Greeks, Isocrates, an Athenian orator, lived to be 98, and the philosopher Heraclitus, as well as the great mathematician, Pythagoras, continued to teach and be productive well past the age of ninety. In 1799, Easton identified some 1,712 individuals who had lived at least 100 years since the onset of the Christian era. One of these was Thomas Parr, who died in 1635 at the age of 152 and was buried in Westminster Abbey. Parr had been brought to London from Shropshire by the Earl of Arundel, to be presented to Charles I because of his remarkable age and vigor. He was subsequently retained as a domestic by the Earl, but died due to exposure to "the foul London air" and the change in his diet, according to Sir William Harvey who performed an autopsy on him.

Based on the Guinness Book Of World Records and other sources, individuals from all over the globe have lived to be well over 100, including: Norway - Christian Drakenberg (145), Russia - Shirali Mislimov (165), Ashura Omarova (195), Iran - Said Musavi (190), China - Li Ching-yun (256), Bolivia - Makarnajo (203), Canada - Pierre Joubert (113), U.S.A. - Charlie Smith (137). There is abundant evidence that elderly people

can be productive and creative, some examples being Titian - 99, Pablo Picasso - 92, Grandma Moses - 101 (started at age 76), Santayana - 88, Bertrand Russel - 91, numerous statesmen (Churchill, De Gaulle), symphony conductors (Sir Adrian Boult - 104), and countless musicians and performing artists like George Burns. Goya entitled a drawing done at the age of 80, "*I Am Still Learning*".

There are certain groups in different areas around the world, where many of the inhabitants remain active well into their ninth decade and beyond. Some of the best documented, include:

- The Vilcabamba Indians in the valleys of the Ecuadorian Andes
- The Abkhazians in the Caucasus Mountains of Georgia
- The Tarahumara Indians of the Sierra Madre
- The Hunza of the Karakoram Range of the Himalayas

Such unusual longevity might be ascribed to genetic factors. However, certain aspects of their lifestyles appear to have important influences that have implications for each of us. Many are engaged in daily physical activities at high altitudes, which increases their aerobic conditioning. In other instances, dietary factors may play a role, such as an increased intake of yogurt or fibrous fruits and vegetables, rich in vitamins, phytosterols, and other antioxidants.

However, it is the absence of stress that may be crucial. As noted previously, *The Yellow Emperor's Canon Of Internal Medicine*, written more than 50 centuries ago, referred to the unusual longevity that was apparently common in even earlier times. In lamenting the loss of this attribute, the author explained:

"... I have heard that in early times, the people lived to be over 100 years old. But these days people reach only half that age, and must curtail their activities. Does the world change from generation to generation - or does man become negligent of the laws of nature?"

"... Today, people do not know how to find contentment within. They are not skilled in the control of their spirits. For these reasons, they reach only half of their 100 years, and then they disintegrate."

As indicated, some pockets of populations still have a number of centenarians who live active lives. One of the most intensively studied groups are the Hunza natives in the Kashmir, who were examined in
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detail by Sir Robert McCarrison, a very observant physician. During the early part of this century, he had been assigned by the British Army to establish a hospital and health care delivery system in the region, and was astounded by the magnificent physical and mental status of the very elderly. He traced family records, conducted detailed interviews, performed careful physical examinations for almost a decade, and kept meticulous records. His overall conclusion was that their unusual health late in life, and their longevity was due to the absence of the stresses of contemporary culture, noting:

"...and they are far removed from the refinements of civilization. Certain of these races are of magnificent physique, preserving until late in life, the character of their youth; they are unusually fertile and long-lived, and endowed with nervous systems of notable stability... Cancer is unknown."

Similar comments were made by Vilhalmur Stefansson concerning the Eskimos, on his first expedition to the Arctic Circle, and Albert Schweitzer about African natives on his initial visit to the Congo. Both also attributed the complete absence of cancer to the absence of stressful Western lifestyles. Both also lived to witness a dramatic change as these aboriginal and primitive peoples became "civilized", and Stefansson actually wrote a book entitled "*Cancer: A Disease of Civilization?*".

What Causes Biologic Aging?

Numerous factors can influence different aspects of the aging process. However, the preponderance of evidence suggests that almost all the common manifestations of old age, including increased atherosclerosis, gray hair, cataracts, wrinkled skin, malignancies, etc., are caused by the cumulative effects of oxidative stress. Oxidative stress is due to the damage done by oxygen free radicals. These are defective molecular fragments that are deficient because they don't have the normal amount of electrons. When we breathe oxygen into our lungs, it attaches to hemoglobin, and is transported through the blood stream to cells throughout the body. Cells take up the oxygen in exchange for their waste products, which are then carried back to the lungs, and eliminated in the form of carbon dioxide. During this process, hundreds of thousands of molecular and chemical changes take place, as oxygen enters into various metabolic activities.

Some of the resultant oxygen molecules lack one or more electrons in their outer shell, and are known as free radicals. Of these, the ($\cdot\text{OH}$), or hydroxyl radical, which has an unpaired electron in its outer shell, appears to cause the most destruction. These are highly charged and extremely unstable, and must instantly find some way to correct this deficiency. As a result, they race around the body, latching on to and destroying cell membranes, and oxidizing cholesterol, DNA, and anything else they can find. It has been estimated that each cell in the body is bombarded by free radicals 10,000 times every day. This disrupts and distorts normal functions, and leads to the formation of other free radicals, setting up a chain reaction which results in further damage and destruction.

Exercise, eating, stress, or anything that increases metabolism, promotes oxygen free radical production. Flies housed in quarters allowing only enough space to walk, live twice as long as those who are given room to fly. Honey bees born in the summer live an average of 35 days, while those born in the cooler days of fall and winter live 8 months, because they expend less energy during daily activities. Researchers can correlate such increased longevity with a corresponding lesser degree of tissue injury from free radical oxidation. Aerobic exercise confers cardiovascular and other health benefits, and it is widely believed that the more you run, the greater the rewards, or "no pain, no gain". However, the more you exercise, the more free radicals you generate. There is now growing evidence that elite runners, especially marathoners, have higher mortality rates from heart attacks and malignancies, most likely due to a chronic excess of free radical production and oxidative damage.

The more you eat, the greater the rate of metabolism and manufacture of free radicals. Sharply restricting caloric intake significantly prolongs the life of experimental animals. In humans, it has also been shown to have a variety of anti-aging effects, including a delay in the onset of osteoporosis, coronary atherosclerosis, and loss of muscle mass, strength, and fertility. There is also a lower incidence of malignancy and infections that result from an age related decline in immune system function.

In addition to stress, there are numerous other factors that can increase free radical production, such as exposure to toxic chemicals, X-rays, ultraviolet light, cigarette smoke, a high intake of iron, and other elements that promote oxidation. Not surprisingly, these are also associated with higher rates of heart disease and cancer as a consequence of free radical damage.

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Antioxidants And Emotional Stress

As their name implies, antioxidants are substances which help prevent the devastation and sabotage of free radicals, by supplying electrons that make them stable. Superoxide dismutase and glutathione are among the natural antioxidants which are manufactured in the body. Estrogen, testosterone, DHEA and melatonin have antioxidant properties, and alleged anti-aging effects. Under normal circumstances, these natural antioxidants block free radical damage, but our ability to manufacture these declines sharply as we grow older. Vitamins C, E, and beta carotene are also antioxidants, as well as a variety of other nutrients found in fruits, vegetables and fresh dairy products, red wine and green tea. Megadoses of certain vitamins, herbals, and other antioxidants, and DHEA and melatonin supplementation are currently so popular, that health food stores have trouble keeping up with demand, but few long term studies are available.

Although all living cells are injured when deprived of oxygen, too much can also cause damage. Antioxidants help to offset this, just as they are used to prevent foods from spoiling, or rubber and other compounds from deteriorating. Similarly, metals and other substances are preserved, as long as they are protected from excess exposure to oxygen, which causes them to oxidize or rust. In a very real sense, we do not wear out, but rather rust out. Strategies to prevent this include reducing caloric intake, an appropriate exercise regimen, antioxidant supplementation, and avoiding stress, environmental pollutants, and other oxidizing influences.

The important role of emotional stress in accelerating aging and facilitating free radical ravage are not generally appreciated, and should be emphasized. It has been shown that 15 minutes after the onset of mental stress, there is a significant rise in LDL oxidation due to increased free radical production. It is oxidized LDL that is responsible for the development of atherosclerotic lesions. Stress also causes atrophy of the hippocampus and loss of memory and cognitive skills. These changes are identical to those seen with aging due to free radical damage, and can be reduced by taking specific antioxidants. However, stress reduction strategies provide the potential for preventing such injury, and have been shown to reduce mortality from cancer and cardiovascular disease. Thus, they may not only add years to life, but more importantly, life to years.

Paul J. Rosch, M.D., F.A.C.P.
Editor

STRESS AND ALCOHOL

There are numerous and conflicting claims about stress and alcohol. Both also share many other common characteristics. Stress can be a killer, and so can alcohol. Conversely, a certain amount of stress increases productivity, and there are good stresses that may promote health. Similarly, there is abundant evidence that modest alcohol consumption reduces risk for heart attacks.

Some people drink because of stress, but many others enjoy a cocktail before dinner, or wine with their meals, when they are relaxed, and the cares of the day are behind them. Both drinking behavior and how we respond to stress are determined by a combination of genetic and environmental factors. These are currently being intensively investigated, to determine whether connections between how we respond to stress may provide clues to drinking behavior, and the development of chronic alcoholism.

The response to stress is complex and involves activation of hormonal activities that have widespread metabolic and physiologic effects. These are further amplified by a cascade of autonomic nervous system responses, all of which affect smooth muscle tone, the breakdown of carbohydrate, fat and protein stores, cardiovascular and gastrointestinal function, the kidneys, and many other organs and systems. Alcohol can also exert important influences on metabolism, the central nervous system, and other systems and organs in the body. When acute stress or alcohol intake is transient, the body is usually able to maintain homeostasis to prevent damage. Chronic stress and chronic alcoholism are much more insidious and harmful, and both can cause impairment in immune system function growth, learning, and memory.

The Relationship Between Stress And Drinking

Some large scale studies suggest that many people drink to cope with job stress, marital and personal problems, or financial worries. In general, the more severe or protracted the stressor, the greater the degree of alcohol consumption, and such drinking behaviors tend to be aggravated in individuals who have poor social support. It is also influenced by genetic factors, past experience, expectations about the ability of alcohol to alleviate stress, the individual's perceived sense of control over the stressor, and other available coping resources, ranging from drugs to religion. High levels of

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stress are most likely to result in abnormal alcohol intake in the absence of alternative resources, when alcohol is readily accessible, and the individual believes that alcohol can alleviate the problem.

Research in animals also reveals that stress increases alcohol consumption, particularly stresses that are experienced early in life. Prolonged stress in infancy may significantly alter hormonal stress response patterns and reactions to other types of stress in later life, that influence alcohol consumption tendencies. In one study, adult alcohol consumption in monkeys who were raised by peers, was compared to matched controls reared by their own mothers. The peer raised group, which was presumably under greater stress early in life, drank twice as much alcohol as those who were brought up by their real mothers. Similarly, rats who were petted and handled for the first three weeks of life, showed remarkably reduced hormonal responses to a variety of subsequent stressors, and also consumed less alcohol. In humans, an association has similarly been reported between adverse early childhood experiences, and increased chronic drinking behaviors, and chronic alcoholism, in later life.

Animal studies also show that when chronic stress is perceived as unavoidable, alcohol consumption increases. Rats who are chronically exposed to unavoidable shock, develop so-called "learned helplessness behavior", when faced with subsequent stressors, and put up little resistance. Such rats also demonstrate increased drinking tendencies, when compared to litter mates receiving similar shocks they could learn to avoid by pressing a lever. Whether this also applies to humans is not clear, although studies of individuals in areas affected by natural disasters, do suggest they are relevant. In one study following a flood at Buffalo Creek in West Virginia, alcohol consumption increased by almost a third over the next two years. Similar tendencies were observed in residents of towns near the Mount Helena volcanic eruption. Detailed interviews following the nuclear accident at Three Mile Island, likewise indicate that increased alcohol consumption was subsequently used as a coping mechanism by many of those sampled. Other research reveals that increased drinking often takes place in anticipation of stress, as well as when it is being experienced.

Does Alcohol Increase Or Reduce Stress?

It can do either, or both, depending on a variety of factors. Hormonal levels in rats subjected to unavoi-

able strenuous activity on a constantly rotating wheel, show that low doses of alcohol may reduce the response to stress. While alcohol is generally thought to interfere with cognitive processes, low doses actually improved the ability to perform complex mental problem solving tasks under stressful conditions in one report. Alcohol can trigger the cascade of hypothalamic-pituitary-adrenal responses to stress. Chronic alcohol intake can increase adrenaline responsivity to stress. This may result in increased resistance to the harmful effects of subsequent stressors, much like the "Stage of Resistance" in Selye's General Adaptation Syndrome, during which the body's defenses are maximized. It is also likely that the stress response is different in those who consume alcohol regularly, compared to teetotalers. Animals who prefer alcohol over water, seem to have different and possibly better adaptive responses to stress, compared to others that avoid alcohol.

Although a clear association between stress and the development of chronic alcoholism has not been proven, both acute threatening and chronic life stresses are usually responsible for relapses in former drinkers. Of all the influences of stress on drinking behavior, the most significant appears to be its influence on the return to drinking after a period of abstinence. One study followed men who had successfully completed an inpatient alcoholism treatment program, and monitored physical and mental health, stress levels, and behavioral patterns. It was found that those who subsequently relapsed, had experienced twice as much severe and prolonged stress before resuming drinking, compared to others who continued to abstain. This group also scored low on measures of coping skills, self-efficacy, and social support. A return to drinking was most apt to occur in men who expected that alcohol would relieve their stress, particularly those who relied on other drinkers for social support.

How Much Alcohol is Good? What Kind Is Best?

There are a number of myths and considerable confusion about the health and nutritional effects of alcohol. Some people believe that beer is a good way to replenish carbohydrates. Some believe that modest alcoholic intake improves exercise performance, while others feel that it causes impairment. The same is true for mental performance. Support for all these varied opinions can be found anecdotally and in the literature. Alcohol is bad for the heart, and can cause cardiomyopathy, particularly in beer drinkers where the
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increased intake of certain associated minerals, like nickel, may be a factor. On the other hand, the cardioprotective effects of red wine have been so well documented, that vintners are petitioning the FDA to allow them to include this information on their labeling. Some studies show that white wine confers the same benefits, and others believe that wine has no superiority in this regard over other forms of alcohol. This is a complex subject, with a great deal of individual variability depending on health status, medications, or vitamins and nutritional supplements, dietary habits, possible distinctions between the personalities of those who prefer wine, beer, or hard liquor, the amount consumed, whether it is on a regular or binge basis, when and why and with whom we drink, etc.

Pure alcohol (200 proof) supplies 7 calories per gram. A one and a half ounce shot of 90 proof gin contains 110 calories, and 100 proof gin has 124 calories. The average 12 ounce can of beer has 146 calories, 13 grams of carbohydrates, and traces of some B vitamins and various minerals, depending on the brand. Light beer and non-alcoholic beer are lower in calories and sometimes carbohydrates. A three and a half ounce glass of table wine contains about 72 calories, 1 gram of carbohydrates, and very small amounts of vitamins and minerals. Dessert or fortified wines like sherry and port have approximately 90 calories per 2 ounce serving.

Daily consumption of one drink a day increases the level of high density lipoprotein, or "good" cholesterol. Women are more sensitive to alcohol than men, and moderate drinking is defined as no more than one drink a day for women, and no more than two for men. One drink would be the equivalent of 12 ounces of beer, 5 ounces of wine, one and a half ounces of 80 proof distilled spirits, or one ounce of 100 proof distilled spirits. However, it is important to note that it is not wise to "save up" skipped drinks, and then consume them all at once. Such "binge drinking" strongly suggests the likelihood of a drinking problem. While one or two drinks of any alcoholic beverage seems to increase "good" cholesterol and reduce the risk of heart attack, red wine appears to confer particular rewards. This may be due to the fact that it contains catechins and phenolic compounds with powerful antioxidant properties that are not found in hard liquor or beer.

The Hazards Of Alcohol

The above should not be misconstrued as suggesting that everyone should have one or two drinks a day. Alcohol is a central nervous system depressant, and can

interfere with memory, visual perception, speech, and optimal performance. In susceptible individuals, it could lead to chronic alcoholism and other addictions. Acute alcoholic intoxication can result in tremors, irritability, anxiety, nausea, vomiting, decreased mental function, and coma. Chronic alcoholism affects a variety of organs, particularly the liver, heart, brain, and muscles. It also causes a loss of important nutrients, including vitamin B1, B6, and calcium.

Alcohol is currently the most abused drug in the United States. Ten percent of users are addicted, and another 10-20% are abusers or problem drinkers. Problem drinkers differ from alcoholics in that they are not physically addicted to alcohol and can often drink with some control. However, they may place themselves and others at risk because of health problems, injuries, increased accidents, a tendency to poor interpersonal relationships, and legal and financial difficulties. Chronic alcoholism is a significant problem in young people. Eighty-five percent of high school seniors admitted to using alcohol in the previous year, and there are three million problem drinkers under the age of 16.

Alcohol should be strictly avoided by children and adolescents, women who are pregnant or trying to conceive, individuals taking certain medications, or who drive or engage in other activities requiring skill and attention. If you don't drink, should you start because of the possible benefits? Most authorities would say no because of all the possible negative cognitive and behavioral effects, as well as the increased possibility of developing liver disease, hypertension and certain malignancies. As noted previously, whether to drink, how much, what kind of liquor, where, when and why, are highly individualized decisions that depend on numerous factors. People with a family history should avoid social drinking, because they are particularly susceptible to becoming problem drinkers.

Like stress, the effects of alcohol vary for each of us. Perhaps the best general guideline is still "moderation in everything", and since things change, one might add, "moderation even in that". Much more research needs to be done, and those who wish to be kept informed, may subscribe to the free periodical, *Alcohol Alert*, published by the National Institute on Alcohol Abuse and Alcoholism. Simply write to: The Scientific Communications Branch, Office of Scientific Affairs NIAA, Willco Building, Suite 409, 6000 Executive Blvd., Bethesda, MD 20892-7003. Additional information and the very latest research findings can be found by visiting their website at <http://www.NIAAA.NIH.gov>.

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Book Reviews • Meetings and Items of Interest

Book Review

The Serotonin Solution, by Judith J. Wurtman, Ph.D, and Susan Suffes, Ballantine Books, New York, 1996, 288 pgs., \$24.00

Dr. Wurtman and her husband have pioneered research for two decades on the relationship between food and mood, and mechanisms involved in mediating hunger, appetite, cravings, and satiety. They are responsible for the development of dexfenfluramine (*Redux*), which was recently approved by the FDA for the treatment of obesity. Dexfenfluramine enhances the activity of serotonin, a neuropeptide which promotes a sense of satisfaction, and blocks stress induced urges to eat. In particular, many individuals tend to crave calorie-rich carbohydrates, which are most apt to rapidly restore or boost brain serotonin concentrations, but also cause weight gain. Serotonin facilitates communication between neurons that modulate mood. Levels are reduced in depression, and when extremely low, appear to be associated with suicidal tendencies. Newer antidepressants, such as *Prozac* and *Zoloft*, are selective serotonin reuptake inhibitors that increase serotonin by blocking its removal.

The authors contend that serotonin can be raised by diets containing foods that are high in certain carbohydrates and low in fat, and this is associated with weight loss in many people. In one long term study, volunteers on such a regimen reported reduced food cravings, which often caused them to eat excessively regardless of whether they were hungry, an improved sense of emotional well-being, and they also lost weight. Psychological hunger usually stems from the stresses of daily life, such as withdrawal from smoking or other addictions, shift work changes, other forms of job stress, or simply going on a weight reduction diet. A similar situation is often seen in premenstrual syndrome (PMS), where increase in appetite and changes in mood occur on a monthly basis, and Seasonal

Affective Disorder (SAD), which affects some people annually with the onset of winter. Low serotonin appears to be the common denominator, and can be prevented by a proper diet. Dexfenfluramine achieves similar results, and the combination of dexfenfluramine and diet appears to provide optimal benefits.

This book provides detailed diets for a number of stress related eating problems, with chapters entitled, "The Serotonin Seekers Diet," "The Stressed-Mommy Diet," "The Mind-Over-Menstrual Cycle Diet," "The Shift-Work Diet," "The Ex-Smokers Stress Plan," "The After-Diet Eating Plan," etc., with an appropriate rationale for each. Most contain 1200 to 1600 calories daily, which is not very severe. Adherence and results can be improved by taking dexfenfluramine. As illustrated by "yo yo" dieters, the secret is not in losing weight but in keeping it off. This well written offering is highly recommended for anyone who seriously wants to attain this goal, with or without pills.

Meetings and Items of Interest

Dec. 9-15 8th International Conference, The Psychology of Health, Immunity & Disease: The Definitive Practitioner's Conference on the Clinical Application of Psychoneuroimmunology and the Mind/Body Connection, Hilton Head Island, SC, call (800) 743-2226

Jan. 23-26 The Spirit of Self-Regulation presented by the Center for Mind-Body Medicine, DoubleTree Hotel at Tysons Corner, Falls Church, VA, call Nancy Harazduk at (202) 966-7338

Mar 12-18 Association For Applied Psychophysiology And Biofeedback Annual Meeting, Better Living Through Applied Psychophysiology: Surfing the Wave of Technology, for info: AAPB, 10200 W. 44th Avenue, Suite 304, Wheat Ridge, CO 80033-2840

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