

The Newsletter of THE AMERICAN INSTITUTE OF STRESS

Volume 2 Number 7, 1989

2nd International Montreux Congress on Stress November 19-21, Hotel Excelsior, Montreux, Switzerland

State of the art presentations on Stress and Cardiovascular Disease include the Pathogenesis of Mitral Valve Prolapse in Anxiety Disorders and Stress, The Stress Connection to Sudden Death, Stress-Related Cardiovascular Hyperactivity in the Pathogenesis of Atherosclerosis and Coronary Heart Disease, The Role of Stress and the Sympathetic Nervous System in the Pathogenesis of Hypertension, and Hypertension as a Disorder of Communication. Other sessions are devoted to Stress, Emotions, Personality and Health, and include an update on Personality Traits As Predictors of Mortality from Cardiovascular Disease and Cancer and the Beneficial Effects of Stress Reduction Strategies. Other segments are devoted to the Stress Reduction Effects of Spa Therapy, How to Design and Deliver an Effective Stress Reduction Program, Psychophysiologic Stress Assessment Techniques, etc. The concluding presentations are devoted to the Biobehavioral Effects of Low Emission Electromagnetic Energy and their use in the treatment of insomnia, depression, anxiety and addictive disorders.

In response to a number of requests, we will be devoting certain issues of the Newsletter to specific topics. The format will include an introductory general overview followed by summary articles reporting on recent relevant research reports. This issue focuses on *Stress and Arthritis and Low Back Pain*.

Stress and Arthritis

The word arthritis comes from the Greek, arthron (joint) and -itis (inflammation). The ape-man of two million years ago had evidence of chronic arthritis of the spine. Similar changes were also found in the Java and Lansing skeletons, 500,000 years old and in Egyptian mummies dating from 8,000 B.C. Egyptian manuscripts over 3,000 years old mention treatments for gout and arthritis with various ointments, heat, or the shock of an electric fish. Many of these same therapies persisted into the present century in remote African villages. The Greeks used the term, rheuma

(flowing) because they thought that rheumatism was due to the flowing of a watery substance into the joints. Fifth century physicians believed that the condition resulted as a "punishment by God for transgressions" and prescribed purgatives, emetics, and leeches. In the twelfth century, a Persian writer attributed the disorder to an inability to express aggression. At the end of the last century, Sir William Osler commented on the association between arthritis and shock, worry, and grief.

There are close to one hundred causes of arthritis including trauma, infections, metabolic and immune disturbances and malignant growths. Females are affected more than men and a majority over the age of 65 have some form of arthritis that is symptomatic. About 90% of the population, over the age of forty, show some X-ray changes of osteoarthritis, and it is the greatest single cause of disability in the elderly. (Continued on page 2)

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For further information on the original source of abstracts and other reprints available on similar subjects, please send a self-addressed stamped envelope to: Reprint Division, American Institute of Stress, 124 Park Avenue, Yonkers, NY 10703.

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The Newsletter of
**THE AMERICAN INSTITUTE OF
 STRESS**

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Stress and Arthritis

(Continued from page one)

Some studies suggest that rheumatoid arthritis is more prevalent in blacks than whites and lower in Japanese and Eskimos. However, there have been no consistent cultural, geographic, or climatic trends, although symptoms tend to be more severe in environments with low barometric pressures and high humidity. Arthritis is responsible for the loss of twenty-seven million work days annually. The average patient spends more than one thousand dollars each year on doctor visits and medication. Total expenditures are estimated to exceed 17 billion dollars annually for these and other arthritis-related services. Rheumatoid arthritis is a common disorder that at times may be crippling. Standard treatment consists of analgesics and anti-inflammatory drugs or physical therapy to relieve pain and improve mobility. Over the past two decades, it has become increasingly clear that like lupus and other connective tissue diseases, rheumatoid arthritis is an autoimmune disorder. For reasons still not clearly understood, the body's immune system mistakenly attacks its own tissues, in this case, certain joints, much as it would act to fight harmful bacteria and viruses. Research has shown that a curious molecule called "Substance P," which is involved in the transfer of pain signals between nerves, is present in high concentrations in those joints most often involved in rheumatoid inflammation. It has been found that certain cells of the immune system which are involved in the inflammatory response, recognize "Substance P" and produce an inflammatory reaction that results in pain, redness, swelling, and ultimately deformity.

It has long been appreciated that flare-ups of rheumatoid arthritis tend to occur during or following periods of severe emotional stress. Recent medical research appears to support this relationship since it has been demonstrated that stress can interfere with immune system function. Rheumatoid arthritis is frequently associated with depression, which also lowers immune defenses. In addition, everyday seemingly minor daily stresses or "hassles" also can reduce the immune system's ability to combat disease causing agents and are similarly associated with flare-ups of rheumatoid arthritis. Newer drugs for treating resistant cases of rheumatoid arthritis usually act by influencing immune system activities. A variety of stress-reduction measures seem to enhance such effects. As will be seen in the following abstracts taken from the recent medical literature, there appears to be a close connection between stress and the onset and clinical course of rheumatoid and other types of arthritis. More importantly, stress-reduction strategies which foster a sense of control and self-efficacy can provide significant benefits through other mechanisms still not completely understood.

"Man is disturbed not by things, but by his opinion about things."
 — Epictetus

Stress and Arthritis: Cause of Effect?

Arthritis specialists differ in their opinion about the relationship between stress and arthritis. Some believe that it is a psychosomatic illness, which in some patients may stem from chronic repressed anger due to childhood rebellion against a cold authoritarian parent. Others subscribe to the proposition that many of the associated personality changes are a result of this chronic painful illness. Psychiatrists speculate that as long as individuals can discharge their hostile impulses through acceptable muscular activities (sports, gardening, working around the house) they can relieve stress which would ordinarily cause excessive muscular tension. When the stress associated with suppressed anger becomes excessive, it leads to increased muscle tension and joint complaints. Patients suffering from a debilitating form of arthritis may feel vulnerable and less able to express anger which could also contribute to increased tension and muscle spasm. Depression is another common manifestation of rheumatoid arthritis and has been associated with disturbances in immune system function that are thought to play a major role in the cause and course of this disorder.

What Kinds of Stress Cause Rheumatoid Arthritis?

In one British study of female patients with arthritis, psychiatrists and rheumatologists working together found that almost all had experienced a significant or new stressful event immediately before the onset of their complaints. Sample items included: husband's firm went bankrupt, having a change at work to an unpleasant job, the abrupt end of a romantic relationship, loss of a previously secure job, death of a close friend, an only child getting married without parental participation in the event, etc. Scientists are generally skeptical about the significance of such anecdotal reports. Most of us, if queried about stressful events in the recent past, could probably come up with some or several situations that would fit that category. Such self-reports, which are after-the-fact must be evaluated carefully. However, the erratic course of rheumatoid arthritis and its frequent relationship to emotional factors also suggest that stress may be an important inciting influence. The disease may be quiescent for a long period of time and flare-ups are often associated with personal problems, such as the death or illness of a friend or family member. This is especially true when the patient has been involved in a long-term relationship providing care or other self-sacrificing activities.

"Convictions are more dangerous enemies of truth than lies."

— Friedrich Nietzsche

Does Stress Trigger Arthritis?

According to some specialists, the answer is a definite yes. A recent round-table symposium entitled "Women and Arthritis" revealed that a significant number of sufferers had identified a significantly stressful event prior to the onset of their symptoms, which they felt was causally related. It may be that stress does not actually cause the disease, but rather accelerates its development in those who are genetically predisposed. Some experts believe that certain types of stress sustained during childhood play an important role in the development of the disease decades later. More than a quarter of children with juvenile rheumatoid arthritis were found to have sustained a severe prior traumatic experience. This was in sharp contrast to a control group where only 10 percent reported such an event. Similar findings were noted in a London study, where more than two out of three women with rheumatoid arthritis, had experienced a severely stressful or traumatic incident in the year prior to development of their symptoms. In contrast, only

one out of five in a carefully matched control group reported similarly stressful situations.

"It is easier to denature plutonium than to denature the evil spirit of man."

— Albert Einstein

Stress Reduction Therapy For Arthritis

It seems clear that in some patients, stress seems to be a factor in the onset or recurrence of episodes of rheumatoid arthritis. This is thought to be mediated by effects on the immune system. Conversely, stress-reduction strategies can improve pain and function in many patients.

More than 15,000 arthritis patients have now completed a twelve-hour patient-education course, first begun at the Stanford Arthritis Center in California in 1979. It was designed to help change patients' behavior and reduce their pain by providing information about their illness and ways to deal with it. The course also provides education as well as a support group for osteoarthritis patients using trained leaders, most of whom have had arthritis, themselves. Patients learn relaxation techniques to reduce their anxiety about the disease and to relieve their pain. Leaders also encouraged patients to devise their own exercises based on general principles, rather than following some specific prescribed routine. As a result, the patients tend to feel more in control of their illness and develop confidence in their ability to deal with their disease. Most usually find they can soon get by with less pain medication and don't have to depend as much on others to pursue their daily activities.

Stress-reduction measures, including biofeedback, meditation, and visual imagery have also been utilized to help arthritis sufferers. However, any benefits may be due more to the feeling of control engendered, rather than the specific intervention. Support from this comes from a study comparing how well biofeedback training and self-efficacy training could relieve the pain of muscle tension headache. Patients received a careful explanation on how these headaches are caused by increased tension in the muscles of the scalp and how biofeedback could help them learn how to relax these muscles or significantly reduce pain. Half of the participants did receive this type of biofeedback training and learned how to relax these muscles when they become tense. The control group received exactly the opposite feedback information so that the more they tensed their muscles, the more they believed that they were relaxing. Half of each group were told that they had been very successful in learning the technique whereas the other half were led to believe that they were only doing fairly well. (Continued on page 4)

Stress Reduction Therapy For Arthritis

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The researchers found that there was a 53 percent reduction in headache pain in those patients who had been led to believe that they had been very successful. This included both those who really learned to relax and others who unknowingly had actually learned to tense their muscles as a result of biofeedback training. The other group, which included those who had learned the technique quite correctly, reported only a 26 percent reduction in headache pain. Thus, it was not the technique itself but rather the patient's belief that they could exert some control over the problem that provided benefits. Some authorities feel that this may also apply to other stress-reduction strategies, such as, meditation, aerobic exercise, yoga, progressive muscle relaxation, etc. While the stress-reduction benefits of such activities can be explained by or attributed to physiologic and biochemical alterations, the important element may be the feeling of self efficacy and control that the individual has achieved. This could be an important factor in any therapy for rheumatoid arthritis, including medication, physiotherapy, moving to a different climate, or even faith in a specific physician, holy water, or shrine. The common denominator may be a placebo-like effect which reduces harmful and injurious stress-related influences by encouraging the feeling of self-efficacy and control.

"Dost thou love life? Then do not squander time, for that's the stuff life is made of."

— Benjamin Franklin

Self Help Reduces Stress And Arthritic Complaints

In one recently reported study, 48 patients were divided in two "experimental" and two "control" groups of 12 each. Four hour-long group sessions were conducted weekly for 20 weeks. The objectives of these sessions were:

- 1) to increase the patient's knowledge of biological processes in health and disease, with special reference to rheumatoid arthritis, stress and coping skills.
- 2) to increase the patient's self-awareness and an awareness of others; and to train them in constructive self-observation on a day-to-day basis.
- 3) to encourage patients to assume control over stressful events in their life, mobilize their own resources and skills, and to move themselves towards self-actualization despite their chronic disorder.
- 4) to enrich the patient's personal, social, and

professional lives through their own initiative and family support.

5) to measure, as far as possible, the effect of the above interventions on the subjective perception of pain, discomfort, fatigue, functioning, and medication requirements, as well as by clinical assessment and laboratory studies.

The group sessions included: education about rheumatoid arthritis, immune system function, psychophysiological effects of stress, and how to adapt or cope with stress. Patients were encouraged to become aware of cognitive cues in themselves and others, and to use them constructively.

Biofeedback was employed as a teaching and training device to demonstrate the ability to control seemingly involuntary processes. Instruction was given in relaxation training, guided imagery, and decision-making techniques. The group leader was a professional rehabilitation counselor who had also suffered from arthritis for 20 years. Patients were evaluated weekly with subjective reports and by a variety of questionnaires at the beginning, half way through, and at the end of the treatment program, with a follow-up one year after its termination. Despite its length, 39 out of the 40 patients continued to the end of the trial, which in itself is a great tribute.

Significant benefits were achieved in affect, personal and social functioning and need for dependence on others. It was felt that the impaired ability of many patients to recognize, experience, and express feelings may be related to early life stress, stresses operating at or about the onset of disease, and the ongoing stress arising from an attempt to adapt to a relentless, stubborn and unpredictably painful, chronic disease. The benefit of this professional peer-led group in terms of social support was quite evident. At the end of the study, the patients incorporated themselves into a non-profit self-helper's group, to continue their activities and provide support for others. Further analysis of the data may disclose whether or not a correlation exists between the degree of improvement and specific endocrine and metabolic changes.

Pseudo-Arthritis and Stress

There are all kinds of arthritis. The most common is osteoarthritis, which may be described as a wear and tear arthritis that accompanies the aging process, and affects up to 90% of elderly individuals. Rheumatoid arthritis generally appears in younger age groups, is more common in women, and is usually a more painful, and crippling disorder. There are also a variety of other forms of arthritis associated with systemic disorders such as gout, psoriasis, and certain inborn errors of metabolism.

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Pseudo-Arthritis and Stress

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Another common disorder which mimics the symptoms of arthritis is known as the myofascial syndrome. It has been estimated that at least a third of patients who complain of symptoms attributed to arthritis are really suffering from myofascial pain. This appears particularly true of patients suffering from low back pain. The real distinction between arthritis and myofascial syndrome is that arthritis primarily involves the joints, whereas, myofascial pain refers to inflammation of soft tissues and muscles. Another distinction is that myofascial pain, when correctly diagnosed is usually simple to treat. Many patients who suffer from myofascial pain are incorrectly labeled malingerers because of the lack of X-ray findings or laboratory studies to provide objective proof of pathology. On examination, there is none of the redness, inflammation, or severe tenderness seen with other forms of arthritis, although the patient may be disabled because of severe or chronic pain.

Muscle strain, poor posture and prior injury may contribute to myofascial pain and some studies report an association with disruptive sleep patterns. However, most authorities agree that anxiety, tension, and stress aggravate symptoms. Some believe that stress is a major cause since it can produce muscle spasm and nerve root irritation, thus resulting in more muscle spasm, and perpetuating a vicious cycle.

In some patients, there are sensitive "trigger points," which can be treated with acupuncture, acupressure, or local anesthesia. Myofascial pain syndrome is thought to be responsible for a large majority of low back pain complaints. Several studies have shown that the vast majority of these patients have a stress-related problem which has either caused or aggravated their condition. More importantly, a comprehensive program of stress reduction and exercise has proven effective in providing complete recovery, even in patients scheduled for surgery because of a neurological deficit or radiologic evidence of severe disease. While muscle relaxants, physiotherapy, or the injection of a local anesthetic can break up the pain-muscle spasm-pain cycle, these may provide only temporary relief. Stress-reduction strategies seem to achieve the same benefits in a more sustained fashion.

"Philosophy separated itself from Science when it asked the question: What type of knowledge of the world and life makes man happiest? This has happened in the Socratic schools. This point of view — happiness — ligated the artery of scientific investigation — and it does it still today."

— Nietzsche

The Low Back Pain-Stress Connection: New Clues For Causes and Cures

It is estimated that 80-90 percent of Americans suffer from back pain at some time during their adult life. 75 million currently list this as a significant complaint, and for two million, the problem is so persistently severe, that they are unable to work. Low back pain represents the single largest cause of worker absenteeism in the United States, Canada, Great Britain and Scandinavia. One large insurance company reports that back-related complaints account for one-third of its disability claims at a daily cost of \$870,000. We spend close to 15 billion dollars annually dealing with it and eight million new sufferers are added every year. The price tag is much higher when one considers the associated depression, pain, and other mental and physical disabilities that severely diminish the quality of life for affected individuals.

Back pain is responsible for almost 20 million doctor visits each year, and represents the leading cause of restricted activity in males under the age of 45. In half of these, it tends to be a recurrent problem, severely disrupting work and leisure activities. Over 200,000 patients undergo corrective back surgery yearly, although in three out of five patients, the procedure fails to provide effective relief from pain. Given the magnitude of the situation, there has been comparatively little research devoted to its scientific study. That may be due to the fact that backaches are not life threatening, and that most patients improve spontaneously within a few weeks. However, the past decade has produced some exciting new theories and treatment approaches which challenge traditional views about cause and cure. Prominent among these is the suggestion that low back pain is primarily a stress-related "Disease of Civilization." Based on this theory, therapeutic strategies have been developed which have proven to be surprisingly effective in long-term studies.

Some of the stronger links in the stress-back pain chain of events were forged by Dr. John Sarno, when he was Director of Outpatient Services at New York University Medical Center's prestigious Institute of Rehabilitation Medicine. He found that almost 90 percent of his patients with low back problems also had a history of other stress-related complaints. These included tension and migraine headaches, heartburn, peptic ulcers, colitis, spastic colon, allergies and other stress-induced disorders. He reasoned that their muscle pain and spasm might similarly be due to stress and tension. As he wrote in his book *Mind Over Back Pain*, "When that theory was put to the test, and patients were treated accordingly, there was an obvious improvement in the results of treatment. In fact, it was (Continued on page 6)

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possible now to predict which patients would do well and which might not."

Dr. Sarno suspected that the pain problem in these patients was not caused by the usual excuse of a bulging disc or arthritic spur pressing on a nerve. It seemed much more likely that the real reason was a decrease in the flow of blood to the affected area. It is well known that stress can produce constriction of blood vessels, resulting in pain in the affected tissues because of lack of oxygen.

A vivid example of this is seen in patients with angina, who frequently experience severe chest pain when they are angry or tense. Such emotional stress can provoke spasm of the coronary arteries, severely restricting the flow of blood and oxygen to the heart, precipitating an attack of angina. Similarly, a significant reduction in the flow of blood to an extremity will produce intense pain. In both instances, the discomfort is due to the decreased delivery of oxygen to the affected muscles. Low back pain and muscle spasm may thus also be a consequence of the diminished supply of blood and oxygen.

Further support for this theory comes from electron microscopy studies. This technique provides such magnificent magnification of tissues, that it is possible to study what is going on inside each individual component cell. When biopsies were obtained from the affected muscles of patients suffering from back pain, nothing startling was noted using a regular microscope. However, the electron microscope clearly revealed changes in those muscle cells consistent with oxygen starvation. Based on this confirmation, a therapeutic program was developed utilizing appropriate exercises and stress-reduction measures designed to reduce spasm and increase the supply of blood and oxygen to the involved muscles. It proved to be extremely successful and the results were far superior to the conventional treatment of complete bed rest with traction or surgery. Although these findings were repeatedly reported in the medical literature, most physicians appeared to ignore or reject them. Some, however, had reached a similar conclusion based on their own clinical experience. Interestingly enough, two of these were well known neurosurgeons with extensive experience in low back surgery.

Dr. C. Norman Shealy became disenchanted with the results of surgery for low back pain and realized that the cause and cure of the problem lay elsewhere. He was the first to use transcutaneous electrical nerve stimulation (TENS) for the treatment of back pain, and subsequently developed a holistic treatment approach to the problem that emphasized stress reduction and exercise treatment modalities. That

was almost two decades ago and now his comprehensive pain and treatment center, has been expanded and relocated in Springfield, Missouri, to include other stress-related pain disorders.

Dr. Hubert Rosomoff, Chairman of the Department of Neurological Surgery at the University of Miami, pioneered the neurosurgical rhizotomy treatment for low back pain utilizing an instrument very similar to a piano wire to pick off the involved pain pathway traveling up the spinal cord to the brain. Although this was less hazardous than major spinal surgery, he also discovered that he could achieve better results with non-invasive rehabilitative techniques. This required a multidisciplinary approach which included exercise, psychological counseling, and occupational and avocational therapy aimed at reducing stress. In a recent interview, he noted that in one review evaluation of some 45,000 patients, only 1% of them truly really required surgery, and that "by and large . . . we are talking about a non surgical disease." 15 years ago he and his colleagues started a four-bed ward at the University of Miami's Comprehensive Pain and Rehabilitation Center for patients with low back pain. Since then it has steadily expanded and thousands of patients originally scheduled for surgery have obtained relief. In view of the fact that a significant number of these represent severe or "end stage problems" resistant to conventional therapy, the 86% success rate of this multimodal approach is quite impressive.

A prime example was the mother of two children who came to the clinic as a last resort. "For 14 years she had been mostly bedridden; to deal with the pain she even had to eat her meals on a stretcher and was taking five times the recommended quantity of morphine." Although she was able to return to a normal routine after treatment at the center, her initial reaction was anger at the medical system in general, because "She felt that she had lost 14 years of her life for no good reason." Another 67-year-old man with a myelogram showing severe constriction of the spinal cord and suffering from bilateral foot-drop would surely have been operated on immediately at most medical centers. Dr. Rosomoff noted that he was "fully recovered after six weeks and on the golf course at eight weeks. He's been there ever since." Like Dr. Sarno, he also came to the conclusion that it was not a herniated disk that was responsible for most of his patients' pain, but rather soft tissue and muscle injury that could best be alleviated by exercise and stress reduction efforts designed to reduce vascular and muscle spasm.

Hans Kraus, a New York physiatrist, who treated John F. Kennedy's back pain when he was President, was one of the first to recognize the stress-low back pain connection. More than 40 years ago, he and other colleagues were involved in a unique back pain clinic at Columbia University. It included ortho-

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pedists, neurosurgeons, neurologists, internists, rheumatologists, psychiatrists, radiologists and specialists in physical medicine, thus attracting a wide assortment of patients with this complaint. They also concluded that more than 80% had no demonstrable organic defect, and that the vast majority could be cured by a combination of exercise and stress reduction and relaxation exercises. This treatment program provided the basis for the national YMCA Healthy Back Program which was introduced in 1976 in over 1000 facilities. Twice a week, for six weeks, patients received an hour of instruction in exercises and stress-reduction techniques which they were encouraged to continue at home on a daily basis. By 1980, over 200,000 participants had completed the program with one-third achieving complete freedom from back pain. An additional 50% reported "significant improvement in both pain relief and freedom of movement." The underlying philosophy of the program was stated in the New York State Journal of Medicine in 1977 as follows:

*"Any plan of treatment for back pain to be successful must correlate with its etiologic element. Our interest focuses on back pain that does not require surgical intervention for its correction and that in the main results from **underexercise and overstress**."*

*Etiologically, back pain often reflects the impact of our present-day mechanized society, one in which physical activity is unneeded and frequently difficult to obtain. Also, it denotes a society in which **many mental tension-producing stimuli overstress susceptible individuals**."*

Stress activates widespread automatic activities that can affect every organ and tissue in the body. However, the major effect and magnitude of these variegated responses differs for each of us. Such reflex reactions have been exquisitely refined over hundreds of thousands of years of evolution to permit survival. The classic "fight or flight" response to acute stress was obviously advantageous to primitive man, suddenly confronted by a ferocious foe. Elevation of the blood sugar provided a quick source of energy, increased heart rate and blood pressure produced a greater flow of blood to the brain for decision making, dilation of the pupils of the eye improved vision, quicker blood clotting, reduced blood loss from internal hemorrhage or laceration, etc. And there was also a shunting of blood away from the gut, where it was not immediately needed for digestive purposes, to the large muscles of the torso and limbs. This facilitated increased muscle tension to improve strength

in combat or a greater ability to escape from a life-threatening situation. However, the nature of stress for modern man is not a physical encounter with a ferocious foe once or twice a month, but rather a host of emotional threats and challenges that often occur several times a day. Unfortunately, our automatic defensive ingrained responses are now not only no longer purposeful or useful, but potentially dangerous. Repeatedly invoked, it is not hard to see how they could contribute to diabetes, hypertension, stroke, heart attack, peptic ulcer, muscle spasm and other stress-related "Diseases of Civilization."

Stress is an unavoidable consequence of life, and is likely to become more intense in our increasingly competitive culture. Our individual responses to stress differ, which explains why some people blush but others get pale. Headache, pain in the neck, chest or stomach pain, diarrhea, and trembling hands are frequent complaints. Most of these are due to spasm in various muscle groups or the blood vessels that nourish them. It should come as no surprise, therefore, that similar reactions may result in low back pain and muscle spasm. It is crucial to recognize that it is often not the external stimulus or event which determines our response to stress, but rather our own preconceived perception of its significance. Often this is a result of psychosocial influences that influence our attitude and behavior. Some research studies suggest that patients suffering from chronic back pain tend to conform to their social environment to an excessive degree. Consequently, there is a frequent tendency to suppress emotions such as anger and aggression, and these feelings are expressed in terms of increased muscle spasm.

Changing the way we perceive and prioritize potentially threatening challenges and other behavioral modification strategies are the best ways to eliminate the adverse effects of stress. Exercise may also be effective in reducing muscle spasm and pain by increasing the circulation to the affected area. Some studies interestingly reveal that the cardio-protective and other benefits of exercise may result more from their associated stress-reduction properties, rather than purely physical conditioning. These and other observations are providing new insights into the relationship between stress and low back pain, in terms of both probable causes, and practical cures.

Book Reviews • Meetings and Items of Interest

Book Review

The Woman's World, Furst, M.L. and Morse, D.R., (eds.). AMS Press, New York, 1988, 146 pp., \$32.50.

This is another volume in the AMS Stress and Modern Society series. The authors had published a previous volume on the same subject in 1982 at the height of the Woman's Liberation Movement and, in some respects, this represents an update or follow-up. It begins with a brief overview of the stress concept, tracing its relationship to a variety of signs, symptoms, and diseases. A subsequent section deals with common stresses encountered by various classes of modern women, particularly those in the workplace. The concluding chapters are devoted to suggestions on how to identify stress and to manage it effectively. This includes psychological and physical coping mechanisms, the role of nutrition, social diversions, as well as standard stress management techniques such as muscular relaxation and meditation are discussed. Distinctions between the nature of stress and stress responses between males and females are emphasized. However, surprisingly little discussion was devoted to Type A behavior which seems to be increasing in females who have to compete in a male-dominated work force where they still do not have equal rights. Many authorities believe that this may be a major cause of the significant increase in cardiovascular disease seen in certain female occupational settings. This volume is well indexed and referenced, and its easy to read conversational style appears to be directed primarily towards a lay audience rather than health professionals.

Meetings and Items of Interest

Sept. 24, Healthy Pleasures, Boston, MA (M.I.T.) Institute for the Study of Human Knowledge. Contact Margaret Caudill, M.D., ISHK/Boston. Box 1062, Cambridge, MA 02238.

Oct. 2-4, Neuropeptides and Immunoepitopes, New York, NY. New York Academy of Sciences, 2 E. 63rd St., New York, NY 10021. (212) 838-0230.

Oct. 11-15, American Academy of Child and Adolescent Psychology, New York, NY. (202) 966-7300.

Oct. 23-25, The Ecology of Work: Improving Productivity and the Quality of Work Life. Toronto, Ontario. Contact Tom Chase, R.R. #2, Box 44a, Northwood, NH 03261.

Oct. 26-29, Academy of Psychosomatic Medicine, Las Vegas, NE. Academy of Psychosomatic Medicine, 5824 N. Magnolia,

Chicago, IL 60660. (312) 784-2025.

Oct. 27-30, Fifth Annual Meeting of the Society for Traumatic Stress Studies "Learning from Victim/Survivors: Insights for Prevention, Intervention, and Care," San Francisco, CA. The Society for Traumatic Stress Studies, P.O. Box 1564, Lancaster, PA 17603.

Nov. 2-4, Cardiac Wellness and Rehabilitation, St. Thomas, VI. Medical Education Resources, (800) 421-3756.

Nov. 2-4, Neuroimmunology VI: The State of the Art, Chicago, IL. University of Chicago School of Medicine. (312) 702-1056.

Nov. 2-5, 1989 23rd Annual Convention of the Association for Advancement of Behavior Therapy, Washington, DC. (212) 279-7970.

Nov. 4-5, Teaching Humanistic Medicine: An Exploration of Goals, Techniques and Experiences, New York, NY, NYU Post Graduate School. (212) 340-5295.

Nov. 5-19, Topics in Psychopharmacology and Biological Psychiatry Moscow, Samarkand, Tashkent, Leningrad, USSR. Professional Seminar Consultants, Inc. (800) 365-5357.

Nov. 9-11, Addiction Medicine: State of the Art California Society for the Treatment of Alcoholism and Drug Addiction, San Diego, CA. (415) 428-9091.

Nov. 17-20, 26th Annual Psychiatric Institute on Group Behavior and Group Leadership, Peachtree City, GA, Emory University School of Medicine. (404) 727-5695.

Nov. 19-21, Second Annual International Montreux Congress on Stress, Montreux, Switzerland. American Institute of Stress (914) 963-1200.

Dec. 3-7, International Round Table on Silent Myocardial Ischemia. For detailed information contact the Congress Secretariat, Tel Aviv; contact Kenes Ltd., P.O. Box 50006, Tel Aviv 61500.

Dec. 7-9, Cardiac Wellness and Rehabilitation, Acapulco, Mexico. Medical Education Resources (see above for details—same as August 4.)

Dec. 10-30, Wellness and Its Relationship to Health Promotion, Protection and Disease Prevention (Cruise: Rio De Janeiro to Buenos Aires, Argentina). Seminars and Symposia Inc. (212) 517-7520.

Feb. 25-Mar 2, 1990, American Journal of Health Promotion, Cancun, Mexico. (313) 258-3754.

Mar. 29-Apr. 1, 1990, American Society of Contemporary Medicine and Surgery (Stress and Hypertension), Phoenix, Arizona.

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