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Stress and Pseudohypertension

The association between stress and hypertension is so widely acknowledged that patients frequently use the terms interchangeably. Pseudohypertension or false hypertension is a term generally used to refer to high systolic pressures in elderly patients because of very sclerotic vessels. A false diagnosis of hypertension is also made in many individuals whose blood pressures are usually well within the normal range but exhibit disturbingly high readings in the medical office setting. This is particularly true when the blood pressure is being measured by the doctor rather than a nurse or medical assistant. Family physicians have recognized this for years, usually asking such patients to relax in some quiet area for about 15 or 20 minutes after which high readings often return to normal. In recent years, as more and more patients have learned how to measure their blood pressure at home, the difference between these readings and those obtained in the office setting have become even more apparent. Results from ambulatory monitoring studies are even more impressive. In one recent report, it was suggested that more than 1 out of 5 patients on medication for modest hypertension really didn't have high blood pressure at all and could safely throw their pills away. Even 5% of those with consistently high readings turned out to have normal blood pressures when the doctor wasn't around. Blood pressure measurements at 15-minute intervals throughout the day also revealed that blood pressures really didn't jump very much with the usual stresses of daily life, although marked elevations were occasionally seen during stressful telephone conversations, especially at work. The phenomenon of "white coat" or "office" hypertension appears to be particularly pronounced in females.

ALSO INCLUDED IN THIS ISSUE

Job Stress and Workers' Compensation Claims Escalating

Stress now accounts for up to 15% of occupational disease claims. In California, such mental stress claims increased more than 5 times in the period from 1980-1986, 47 times faster than other overall disability claims. Further, awards averaged $15,000, more than twice as much as those for ordinary physical disability. In Oregon, the courts awarded lifetime compensation to the president of a company who claimed that being involved in bankrupt proceedings depressed him and drove him to alcoholism. In Massachusetts, a training specialist sued successfully because she had a nervous breakdown after she was notified she would be laid off and transferred to another department. A nurse *(continued on next page)*

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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Job Stress and Workers' Compensation Claims Escalating *(continued from pg. 1)*

sued successfully claiming that her physician-employer gave her all the "dirty" jobs, such as informing patients of positive tests for cancer. Even when such problems occur outside the office, an employer may still be liable. Many claims are hard to resolve because it is often difficult to prove that problems stem from an individual's personal life and difficulties at home.

Some states are fighting back. Oregon has now passed measures that disallow claims for stress due to such "reasonable" employer actions as firing, discipline, and performance evaluations. Massachusetts has also enacted a series of measures that prevent stress claims based on transfers and layoffs.

Many companies have tried to reduce their exposure to compensation claims by instituting stress management training. Such activities have now become the leading priority for employee assistance programs in some parts of the country and appear to be cost effective. One company cut its total annual workers' compensation claims, many of which were believed to be stress related, to 93,000 compared to 272,000 for a similar time period preceding the institution of a stress reduction program utilizing meditation, biofeedback, and muscle relaxation techniques.

"A cheerful interest in the activities of the day, strong motivation, and purpose in life will overcome fatigue and enable an individual to work efficiently with small amounts of sleep." — T. Harrison

Stress and Arthritis

A strong relationship between stress, emotions, and rheumatoid arthritis has long been suspected. Some authorities are convinced that stress can actually cause the disease. In a recent symposium, a Harvard professor noted that at least 10% of patients attributed the onset of arthritis to an emotionally stressful event. Most authorities agree that emotional stress can exacerbate existing arthritis and that this is most apt to occur in those with a genetic predisposition. Others feel that early childhood stress may have something to do with the onset of the illness. Almost 30% of children with juvenile rheumatoid arthritis were found to have undergone a prior traumatic experience in contrast to 10% of a controlled group without the disease. Further support comes from experimental studies such as Selye's original research which demonstrated that rheumatoid arthritis lesions could be produced in experimental animals as part of the General Adaptation Syndrome.

Killer Whales and Stress

Despite their name, appearance, and obvious ferocity when attacking other fish, killer whales are generally considered "quite gentle and friendly with humans" according to a recent *New York Times* report. In fact, many scientists prefer to call them orcs after their scientific name, Orcinus orca, because killer whale is a misleading misnomer. Actually, their behavior and lifestyles are not unlike those of humans. They travel in "pods," or kinship groups of 15 or 20, much like extended families and are not incestuous. Like humans, these whales mature sexually in their teens, can live as long as 70 or 80 years and appear to be "the highest evolved creatures in the ocean." And, like some of us, they are said by some experts to be so emotionally sensitive that they get ulcers when unhappy or depressed.

As a consequence, experts are puzzled about 14 recent accidents at Sea World in San Diego involving the human trainers of four killer whales in captivity there. Some of the reasons cited were the possible introduction of an aggressive male into the tank with females of breeding age which altered the social mix. Another factor may have been a high turnover among the trainers and repeated loss of warm relationships that had been developed. Others feel that confined space, constant noise from filtering and pumping equipment, and lack of a varied daily diet were stressful influences that altered the whale's behavior. Despite Moby Dick, there is "no case of a whale ever killing a human in the wild." Many feel *(continued on page 3)*

Killer Whales and Stress *(continued from page 3)*

that all killer whales should be set free. "Putting a whale that is used to swimming in the wild into captivity is like putting a human in a closet." If they are kept in captivity, however, they should be taught different tricks or stunts because they require variety and activity and become depressed when left alone in the pool with nothing to do and no place to go. As one expert said "they could be kept healthy but no facility is big enough to keep them happy."

Denial and Dealing With Stress

People deal with the tremendous stress of a life-threatening illness in different ways. Many cope by denying the seriousness of the situation which may provide some short-term benefits but often results in harmful consequences down the line. Heart attack patients frequently deny their illness. In one Yale study of 45 male coronary patients who were interviewed after their heart attack, bypass surgery, or both, denial took several forms. Some used it to protect themselves during the early days of extreme danger, but later came to grips with the problem. Others continued to reject the reality of their condition long after discharge from the hospital unit. Deniers did better in the short run, spending less time in the hospital and suffering fewer complications. However, those who faced facts had fewer rehospitalizations and better and longer lasting recovery periods. The researchers also tracked health and compliance with physicians' orders to quit smoking, attend exercise classes, make dietary changes, etc. for one year after discharge from the hospital. Those who continued to deny their problem were more apt not to follow such recommendations. It was suggested that initially denial may have some immediate early benefits by reducing fear, depression, anxiety, and the release of stress-related hormones. However, in the long run, it can be detrimental, since it discourages patients from taking steps to improve their chances of sustained recovery.

Job Stress and Pill Popping

A recent German study confirms that job stress can be a major cause of addiction to various medications. The survey revealed that individuals who regularly took pain killers, sleeping pills, and tranquilizers tended to be hard-working compulsives with little control over their job activities. Women doing assembly-line piece work were the classic example. Social workers also frequently "popped pills" to "keep up the pace" or "last the distance" because of the persistent emotionally stressful demands placed upon them. Twice as many women as men suffered from addiction to a variety of medications possibly because most of the social workers were female. Individuals who become addicted to drugs often suffer severe withdrawal reactions when they try to stop or alternatively find they need increasing amounts to achieve the same degree of relief from pain, anxiety, or insomnia. Often a vicious cycle is created similar to that encountered by many alcoholics. However, while there are a wide range of activities and support systems available to help alcoholics, pill popping has been largely ignored or dismissed as a problem for the individual rather than society to deal with. The study was also critical of German physicians suggesting that they are largely to blame for the fact that too many drugs are being prescribed.

"The power and the beauty of science do not rest upon infallibility, which it has not, but on corrigibility, without which it is nothing."

Howard E. Grober

Stress and Good Grades

A recent study of first-year dental students was designed to investigate how stress affected academic performance. One hundred and twenty students were tested for State and Trait Anxiety Inventory during each trimester to evaluate situational as well as general anxiety. Stress related problems included cardiovascular complaints, gastrointestinal symptoms, loss of appetite, sleeplessness, fatigue, irritability, headaches, drug dependency, increased sweating, depression, anxiety, and difficulty with memory and concentration. Among the sources of stress were final exams and grades, time pressures, too many assignments, financial concerns, unfulfilled expectations, feelings of incompetence with instructors, and a lack of personal time for relaxation and social contact. Such problems are significant since 3.5% of dental students drop out for such stressful personal complaints rather than academic deficiency.

The results of the study confirmed prior investigations which revealed a strong inverse correlation between *(continued on page 4)*

Stress and Good Grades

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anxiety scores and grade point average. Students with low anxiety scores had associated high grades and those with high anxiety scores had much poorer academic records. Interestingly enough, this relationship appeared to hold true only with respect to the second and third trimester. This suggests that stress during the first year of dental school is cumulative, building up progressively during the course of the year, especially in high anxiety prone students.

Is Stress Reduction Training Cost Effective?

Five hundred and eleven billion dollars were budgeted in 1987 for medical care with almost half coming from medical plans purchased by private corporations. As the work force ages and retirement and long-term care benefits are expanded, costs are increasingly being shifted from the government to the private sector. It is projected that private corporations will eventually assume 70% or more of this burden. Medical care costs and benefits currently represent about one-third of the average person's salary and are continuing to rise at a rate that is two to three times greater than the overall inflation index. Major expenses stem from cardiovascular disease, chronic back disorders, headache, and accidents, all of which have been shown to be stress related. A report from the Bureau of National Affairs suggested that absenteeism could be reduced by at least 50% through appropriate attention to the physical and emotional needs of workers.

A variety of studies have shown that providing mental health services results in a sharp decrease in medical care utilization. A four-year analysis of claims of 136 Blue Cross subscribers showed that medical/surgical utilization dropped more than 50% following psychological counseling. In more than 4 out of 5 patients, less than 15 visits were required. A 20-year Kaiser Permanente study also disclosed that 60-90% of stress-related medical costs were more than offset by appropriate psychological intervention. Furthermore, this improvement persisted during the five years following the termination of any treatment with the most significant declines in medical costs occurring in the second year following the first interview. Sustained benefits following treatment could be demonstrated over a five-year period even in patients who had only a brief therapeutic session on one to eight occasions.

While these reports demonstrate the efficacy of individual treatment, there is good reason to believe that stress management training techniques offered in group settings also prove effective. One such program offered to Equitable Life Assurance employees involved training sessions held three times a week over a five-week period, utilizing breathing exercises, muscle relaxation techniques, and biofeedback training. Follow-up study three months later revealed fewer visits to the health center, decrease in stress-related symptoms, increase in work satisfaction, and significant improvement in work performance. Cost/analysis benefits showed an impressive 1:5.5 ratio for the training program. In another report, employees in several hospitals as well as a trucking concern were taught how to identify and eradicate work site stressors. Psychological counseling was provided for both work- and non-work related problems, and the workers learned various ways to manage stress as well as how to promote a healthy life style as part of a stress reduction program. Combined hospital and accident-related losses went from an average of $24,199 per month in the two years preintervention to $2,577 a month in the eleven months following institution of the program. One hospital reduced the number of such claims from 3.1 per month to 0.6 and average monthly expenses for medical claims fell from $7,329 to $324. In addition, there was considerable improvement as assessed by decreased disability expenses, diminished absenteeism, and improved productivity.

"Human life is but a series of footnotes to a vast obscure unfinished masterpiece."

V. Nabokov

Aerobic Exercise, Stress And Hypertension

Jogging, running, and aerobic exercise seem to provide an effective form of stress reduction for many individuals. In addition to relieving symptoms of anxiety, depression, and promoting a sense of well being, regular exercise also appears to confer cardiovascular benefits. Further, support for this comes from a recent study of 70 normotensive college students, 49 of whom had a family history of essential hypertension. Blood pressure and heart rate were measured at baseline and while the students performed a series of stressful tasks. A bicycle test was used to determine aerobic fitness. The 10 most aerobically fit men in the group with a family history of hypertension showed the same level of cardiovascular arousal in response to stress as did those with a negative family history. The 12 least fit men in the group with a positive family history exhibited much higher levels of arousal.

Mental Stress and Silent Ischemia

An article in the *New England Journal of Medicine* attracted national attention a few months ago because it demonstrated that "mental stress" in patients with coronary artery disease could cause as much obstruction of the flow of blood to the heart as vigorous exercise. Moreover, electrocardiogram and sophisticated imaging techniques confirmed that most of these potentially serious changes were not associated with any symptoms and patients were completely unaware of any potential problem. The most severe interference in blood flow occurred when the subjects were asked to participate in a brief public speaking task. Indeed, all of the activities and techniques designed to produce "mental stress" involved some form of verbal communication. This is an important point which was overlooked in the article. Extensive research has shown that blood pressure and heart rate rise significantly during speech. The magnitude of the elevation is influenced by many factors including the speed and loudness of speech, the affective content of the dialogue, the size and/or relative social status of the audience, and the level of baseline blood pressure. In general, the higher the resting blood pressure, the greater the degree of elevation. Talking to an infant or pet results in less blood pressure elevation than talking to an adult, particularly one of perceived higher station. Increasing the volume or speed of speech produces greater rises. Reading out loud, especially at rapid rates, caused significant elevations of blood pressure and pulse rate in one study, whereas reading the same material silently had no effect.

The mechanisms involved in this phenomenon have not been fully delineated, but appear to be related to an increase in peripheral resistance. Prolonged breath holding, which raises blood pressure, may be a factor. Certain aspects of the communication process itself are important since blood pressure also rises when deaf mutes communicate by signing, but not when they move their hands in a meaningless fashion. It is not clear whether or not these same factors which cause unappreciated blood pressure and pulse rate elevations while speaking also produce silent ischemia. A report in press confirms that they may contribute to increased disturbances in heart rhythm and this would appear to be a fruitful area for further investigation.

"If we have keen vision and feeling of all ordinary human life, it would be like hearing the grass grow and the squirrel's heart beat and we should die of that roar which lies on the other side of silence."

George Eliot

Caffeine, Stress, and Blood Pressure

Everybody has heard of "coffee nerves" and how caffeine can contribute to insomnia, jittery feelings, and palpitations in some sensitive individuals. Blood pressure can shoot up even after only one or two cups of coffee, and this effect seems to be enhanced when individuals are simultaneously under stress. This is most marked in individuals with a family history of hypertension and is important since caffeine use tends to increase during stressful situations. Other studies also reveal that the mechanism of caffeine-induced hypertension varies with different behavioral states. Under resting conditions, caffeine increases systemic vascular resistance, but when combined with behavioral arousal, cardiac output also increases. These findings could be confirmed even in young, healthy males between the ages of 20-36 without any history of cardiovascular disease, regular use of nicotine, recreational or prescription drugs, or caffeine sensitivity. While caffeine did not affect the secretion of adrenal cortical hormones at rest, it did potentiate the rise in cortisol associated with performing a mentally stressful task. Both caffeine and such tasks increased plasma norepinephrine levels, with the augmentation relationship being additive rather than interactive.

Such observations may be important in those at risk for cardiovascular disease. Caffeine-induced vasoconstriction and enhancement of stress-related cardiac stimulation may produce adverse effects that could precipitate or aggravate a variety of cardiovascular signs and symptoms.

"An intellectual is someone whose mind watches itself."

A. Camus

Should Type A Behavior Be Changed or Treated?

According to one recent study, the answer is a resounding yes. 289 Type A patients had received behavioral modification counseling over 4.5 years and an additional group of 104 had undergone similar counseling for a year prior to its discontinuation. Despite the passage of a year after receiving this counseling about Type A behavior, tests not only showed a decline in Type A behavior, but also a reduced rate of recurrent heart attacks.

Does Stress Affect the Onset of Adult Diabetes?

According to a recent Israeli study, a physically or psychologically stressful event may cause the onset of non-insulin dependent diabetes mellitus. One hundred fifty-four such diabetics were given questionnaires to obtain information about age, sex, duration of illness, family history, and possible stressful events which occurred within a year prior to diagnosis. Over 90% were older than 40, with the majority being males between the ages of 41-60. A genetic predisposition was confirmed in 72% of the cases, with 58% reporting diabetes in a parent or sibling, and 14% in more distant relatives. Almost half reported some sort of precipitating stressful experience, 14% complaining of family or work problems, 3% of an accident, and 2% had experienced a febrile illness. Of these patients, one out of five claimed that the onset of diabetes followed the stressful event within days, half said it was within weeks, and a third within a few months. The percentage of those reporting some stressful link to their illness was the same in those with or without a genetic predisposition. An earlier study had reported 3 out of 4 diabetic patients felt that a prior stressful event precipitated the onset of their illness with over half of this group having a strong family history of diabetes.

"Se no e vero ma e ben trovato — It may not be true but it is well contrived." — Giordano Bruno

Diabetes, Type A Behavior, And Bad Cholesterol

A recent report suggests that anger and hostility are the components of type A behavior most likely to be predictive for future heart attacks. Other data suggests that levels of total cholesterol, especially low density lipoproteins (bad cholesterol) also show a positive correlation with cardiovascular disease. To determine whether these two observations had some association or interrelationship, 352 Type A individuals were evaluated. In general, Type A behavior and high hostility showed a significant positive correlation with total plasma and low density lipoprotein cholesterol levels. Type A behavior correlated with elevated cholesterol but hostility alone showed no such relationship. The combination of Type A behavior and hostility achieved the closest correlation with total plasma and low density lipoprotein cholesterol. These findings are consistent with earlier studies of cardiac patients who underwent coronary angiography. Those patients having at least one occlusion of 75% or greater scored highest on Type A behavior and hostility scales. The mechanisms underlying such relationships are not clear. It has been suggested that overly competitive Type A's, who also have a basic mistrust of others and thus tend to be hostile or cynical, may suffer from a chronic state of arousal. This could lead to an increase in catecholamine secretion which in turn could cause lipid mobilization favoring the development of atherosclerosis.

"Understanding is the reward of faith. Therefore, seek not to understand then you may believe, but believe that you may understand." — Saint Augustine

Psychosocial Predictors for Heart Disease

A Swedish study suggests that, in women, clinical manifestations of coronary heart disease are linked to different psychosocial traits. A 12-year study of almost 800 women between the ages of 38-54 revealed that angina "was associated with passive dependency, neuroticism, strain, depression and particularly the grade of mental disorder." Type A personality traits were not significantly associated with heart attacks but "low ratings of guilt and neurotic self-assertiveness" did seem to have predictive power. ECG changes consistent with ischemic disease surprisingly correlated with low ratings of aggression. Women with the lowest aggression scores had eight times as many ECG changes of ischemia as those at the highest end of the rating scale.

Psychological Stress Triggers Silent Ischemia

Silent myocardial ischemia is a particularly troublesome risk factor for heart attacks and sudden death since such patients do not get the usual warning signs of chest pain or other anginal symptoms when the blood supply to the heart is deficient for its needs. A recent British study of 30 patients whose electrocardiograms revealed changes of transient ischemia on two occasions although they had no symptoms. They coincided with the times that patients underwent psychologic stress because the results of coronary angiography and/or the need for surgery was being discussed. There were additional markers that confirmed the presence of stressful states such as urinary excretion of cortisol which was significantly higher during the periods when the patients said they were under increased stress. In addition, patients who excreted more norepinephrine during stressful periods also showed more ECG evidence of silent ischemia during the same time interval.

Stress Reduction Speeds Recovery from Surgery

The stress of surgery has both psychological and physiological components. Recognizing and minimizing the latter may provide important health benefits. It has previously been reported that the manner in which patients are warned preoperatively about the potential risks of anesthesia or surgery can significantly influence the incidence and severity of complications. A variety of attempts to reduce surgical stress have been utilized including hypnosis, relaxation procedures, educational training videotapes, breathing and meditation exercises and specially created musical audio cassettes. One review of some 34 studies involving more than 3,000 patients revealed that those who had received such psychological preparation left the hospital an average of two days earlier than those with only routine care. Other benefits included reduction in pain, fear and feelings of helplessness and anger. In another report of 60 men who underwent coronary bypass surgery, one group received the standard hospital routine as well as a brochure on the procedure and a brief visit from a nurse to answer specific questions. The other group watched a specially prepared videotape which followed a patient through the operation and recovery. Part of this second group also received advanced instruction in deep breathing exercises. Three out of four of those who had received only the standard preparation had potentially dangerous severe hypertension postoperatively in contrast to only 45% of those who had watched the videotape. In addition this latter group reported much less preoperative and postoperative anxiety and seemed more relaxed to nurses during the week following the surgery. The subgroup that had received extra instruction in breathing exercises as well, had the least anxiety.

Psychosocial Stress Affects Surgical Results

As noted above, stress reduction approaches appear to reduce the complications of anesthesia and surgery. Further support for the important influence of stress on postoperative complications and length of hospitalization comes from a recent study of 24 otherwise healthy men who underwent elective inguinal hernia repair. Preoperative stress was evaluated by measuring physiological reactivity to the cold pressor test and tabulating stressful life events during the preceding six months. In addition, the availability of social support systems and anxiety about the impending surgical procedure were also evaluated and rated. Tests of immune system function were performed prior to, three days after, and 30 days after surgery. Patients who had undergone significant life stresses in the preceding months exhibited much more anxiety about the surgical procedure. There were also marked differences in measurements of immune system function. Those who scored high on both the cold pressor response and stressful life events measures showed evidence of diminished immune responsivity prior to and three days after surgery. These differences disappeared 30 days later. Psychosocial stress appeared to have the most influence. Those who had high recent life stress scores had the lowest immune responses, a correlation which could not be demonstrated for high cold pressor test responders. However, those who scored high in both these measures of stress required significantly more narcotics after surgery, had more postoperative complications and longer hospitalizations. Postoperative complications were positively correlated with evidence of decreased immune system function. Having a strong social support system also seemed to be associated with better immune system function and fewer postoperative complications.

Special Notice

(repeated from last issue)

The American Institute of Stress is sponsoring the First International Congress on Stress in Montreux, Switzerland, November 30 - December 4, 1988. Leading experts from the United States and around the world will present state of the art information on Stress and Cardiovascular Disease (hypertension, coronary heart disease, sudden death, type A), Stress and Immune System function, (AIDS, Cancer), Job Stress (sources, signs and symptoms, solutions), Stress Reduction Techniques and Stress Management Training, Stress Assessment Methodologies, as well as the role of back pain, etc. A particularly interesting segment co-sponsored by biobehavioral effects of electromagnetic energy and the unique role of electrical energies in medical diagnosis and treatment. Novel diagnostic and therapeutic instrumentation and devices which are useful in managing anxiety, insomnia, pain and other stress-related complaints will be exhibited. Many of these are currrently not yet available in the United States. For further information on reduced rates write to the American Insitute of Stress of call 1-800 24RELAX.

Book Reviews • Meetings and Items of Interest

Book Reviews

Occupational Stress: Health And Performance At Work. Wolf, S.G., Jr. and Finestone, A.J. PSG Publishing Co., Littleton, MA, 1986. 255 pp. $29.50.

This compact volume, whose senior editor is one of the pioneers in the field of stress, is a concise but comprehensive overview of the problem of job stress. There are 19 excellent chapters including interesting historical background contributions, CNS and neuroendocrine mediators of stress, adverse effects of shift work, problems of aging and retirement, corporate liability for occupational medicine programs all written by authoritative contributors. There are also practical segments devoted to identification and treatment of occupational stress problems which emphasize that workers require a purpose for their activities, a suitable way to demonstrate their talents and competency as well as some reassurance that they are needed. Jobs with high demand or responsibility but little authority or decision-making capacity are most apt to result in cardiovascular and other health problems. Figures and Tables are of high quality, and the more than 300 references are unusually up to date. Highly recommended for those interested in any aspect of the subject of occupational stress and particularly its sources, pathophysiology, symptomatology, economic repercussions—and what can be done about prevention and treatment.

Stress and Addiction. Gottheil, E., Druley, K.A., Pahko, S. and Weinstein, S.P. eds. Brunner/Mazel, New York, 1987. 327 pp. $40.00

This is the ninth in the Psychosocial Stress Book Series, one of the few "refereed" publications in this field. The major focus is on alcohol so that those with special interest in cocaine, heroin, marijuana, amphetamine, or medication abuse may be disappointed, although the inference is that similar mechanisms and relationships are also applicable to these problems. The 21 chapters are divided into four sections dealing with clinical aspects of alcohol, drug and stress interactions, biochemical and animal studies of the effects of alcohol on the response to stress, research in humans on the physiological and psychological effects of alcohol, the role of social support systems in therapy, and a final segment dealing with the latest theoretical concepts of the mechanisms and treatment of addictive states. A truly eclectic and multidisciplinary approach with contributions from leading authorities in various fields that discusses in depth such thorny questions as why alcohol consumption can either increase or decrease tension and stress, and when it represents an addictive disease rather than a controllable habit. The growing dimensions of the substance abuse problem may be appreciated by noting that 20 years ago there were an estimated 10,000 cocaine users in this country compared to over 20 million today purchasing $30 billion worth of the drug annually. The societal costs attributed to alcohol problems have also steadily increased and are now pegged at $100 billion annually. This volume goes a long way towards providing some insight into the sources of this problem and the best approaches for stemming this rapidly rising tide.

Meetings and Items of Interest

June 26-July 1, Neuroimmunomodulation, Copper Mountain, CO., Federation of American Societies for Experimental Biology, (301) 530-7093.

July 3-8, Ultradian and Infradian Modulation of the Circadian System, Copper Mountain, CO., Federation of American Societies for Experimental Biology, (301) 530-7093.

July 11-14, The Role of Exercise and Nutrition in Preventive Medicine, Crested Butte, MO., ISC Division of Wellness, (813) 686-8936.

July 22-24, Depression-Psychobiology, Psychodynamics and Therapy, Harvard Medical School, Department of Continuing Education, Boston, MA 02115.

Aug. 30-Sept. 3, Third International Interdisciplinary Conference on Stress Management, University of Edinburgh, Scotland.

Oct. 13-15, Psychobiology of Human Eating Disorders, New York, NY, New York Academy of Sciences, (212) 838-0230.

Nov. 17-20, 35th Annual Meeting of the Academy of Psychosomatic Medicine. New Orleans, LA. (312) 784-2025.

Nov. 30-Dec. 4, First International Congress on Stress, Montreux, Switzerland. Contact American Institute of Stress, 1-800-24 RELAX in NY (914) 963-1200.

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