

The Newsletter of THE AMERICAN INSTITUTE OF STRESS

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Plenary Sessions on Stress and Depression, The Evolution of Global and Coronary Prone Type A Behavior, Clinical Applications of Psychoneuroimmunology, International Labor Organization Survey of Job Stress Around the World, Advances in Occupational Health Promotion and Stress Management. Stress Reduction Workshop Featuring Oriental Approaches, Stress and Subtle Energies (aromatherapy, touch, massage, biomagnetic influences, imagery), Post-Traumatic Stress Disorder. Presentation of Hans Selye Award to Ray H. Rosenman, M.D. Round Table Discussion with other Award Recipients on "Stress and Quality of Life" (Stewart Wolf, Bjorn Folkow, Jim Henry, Yujiro Ikemi, Lennart Levi, Joel Elkes). Registration Limited.

ARE THERE STRESS REDUCING FOODS AND DIETS?

Stress is different for each of us. For some, it is manifested as chronic anxiety, depression, or fatigue. Others complain of headache, insomnia, palpitations, upset stomach, and a host of other signs and symptoms that don't seem to have any physical cause. In addition, things that are distressful for one person, may actually be pleasurable for another, or have little impact either way. That's readily illustrated by watching passengers on a steep roller coaster ride. Some are crouched in the back, eyes shut, jaws clenched, and white knuckled as they clutch the retaining bar. They can't wait for the ride in the torture chamber to end so they can get back on solid

ground and get away. But up front are the wide eyed thrill seekers, cheering and relishing every steep plunge, who race to get on the very next ride. In between, you may find some with an air of nonchalance that borders on boredom. Similarly, stress also affects each of us in divergent ways, with respect to its influences on what, when, why, and how we eat.

Just as stress is very different for each of us, there is no single stress reducing diet or other strategy that benefits everybody. Jogging, meditation, and yoga are great for some people, but dull, boring and stressful for others. It's important to keep this in mind when considering claims for stress reducing foods, vitamins, and a host of nutritional supplements that allegedly alleviate stress. However, a faulty diet can certainly be a source of stress, and conversely, stress can lead to a variety of poor eating habits. Stressed out, tense individuals often eat excessively or compulsively to reward themselves, or to pro-

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

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vide some distraction from their problems. Others may have loss of appetite or heartburn, and skip meals. During situations of acute stress, blood is shunted away from the stomach and gut to the larger muscles of the arms and legs, to facilitate "fight or flight" responses. That's why it's much more difficult and takes longer to digest food properly, when you're angry and upset.

Stress often interferes with adhering to a proper diet, especially for women. Although careful to attend to the nutritional needs of their family, they often tend to neglect themselves, grabbing whatever is available to munch on, whenever it is convenient. Overeating due to stress is a major cause of obesity for many individuals. However, being obese can also cause stress, leading to a vicious cycle. Stress can also lead to eating disorders like bulimia and anorexia, which can have serious health consequences, or even prove fatal.

Although stress does differ for each of us, the feeling of being out of control is always distressful. That's what distinguished the people in the back of the roller coaster from those in the front. One of the best ways to reduce stress in your life, is to gain more control over your activities. Most of us can do something about what and how much we eat, if pointed in the right direction. Although there is no universal diet to relieve stress, there are some general recommendations that can help you stay healthy and also lower your risk for developing cardiovascular disease and certain cancers. For many people, knowing that they are doing every-

thing they can to eat properly so they can avoid these leading causes of death is reassuring. It also provides a feeling of control over this important aspect of their daily life which does help reduce stress. A half dozen of these tips include:

1. Try to eat a variety of foods in amounts designed to achieve a healthy weight.
2. Vegetables, fruits, grain products and complex carbohydrates are most likely to help you reach and maintain this goal.
3. Limit your intake of refined sugar, salt and alcohol.
4. Avoid foods high in sodium, saturated fat and cholesterol content.
5. Try to drink 8 glasses of water a day.
6. Make sure that you have an adequate intake of essential nutrients and vitamins, especially if you are trying to lose weight.

The last two items are particularly important with respect to stress. Water is an important nutrient that is often neglected in planning a diet. The average office worker loses about 10 cups of water a day during normal activities. If you're under stress, or sweating because of exercise or the heat, you need to drink even more. Coffee and cola drinks are not good substitutes, since they contain caffeine which can act as a diuretic. All chemical reactions that transform food into energy in the body require water. The brain is about 75% water by weight, and is the first organ to be affected by dehydration. Although symptoms may not occur unless fluid depletion is severe, deficiencies do keep you from thinking and performing at your best, and could produce or aggravate stress related complaints like fatigue and headache. You need a minimum of eight, 8-ounce glasses of water a day to replace lost fluids to avoid this. It's best not to try to accomplish this all at once, or to drink only when you are thirsty. Juice, milk and caffeine free sodas are good alternatives, if you're home. At work, take a trip to the water cooler during coffee breaks. Having a glass and a pitcher of water handy, perhaps with some lemon slices available, can also be helpful.

Everyone knows the importance of insuring an adequate intake of vitamins and essential minerals, and the need to take appropriate supplements if these are not readily available in your diet. However, there is increasing evidence that much larger than normally recommended amounts of Vitamins C, E, and beta carotene, may protect against heart attacks and cancer. More importantly, they also appear to retard many other manifestations of the aging process, and this has important

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links with stress. Hans Selye, who coined the term **stress** as it is commonly used, later described it in popular terms as "the rate of wear and tear on the body". That also happens to be a pretty good description of the aging process. Selye demonstrated that chronic stress caused premature aging and various degenerative diseases, like arthritis, hypertension, and heart attacks in experimental animals. Stress accelerates the development of microscopic changes that are associated with old age, such as arteriosclerosis, and distorted changes in cells that can lead to malignancy.

Most of the manifestations of aging appear to result from the activity of "free radicals". These are not liberated Communists, but unstable molecules released as a result of normal metabolic activities in the body that consume oxygen. They are highly reactive, and latch on to whatever they come in contact with, injuring cell membranes, inducing mutations in DNA and genes, and causing widespread and bizarre disturbances in normal cellular function. They are normally neutralized by natural antioxidants that scavenge the body to seek them out and render them harmless. However, our ability to make antioxidants declines as we grow older, and increased free radical damage hastens the development of cataracts, grey hair, skin changes, atherosclerosis, abnormal cell growth and other attributes of aging. There are different kinds of free radicals and various types of stress can promote their activity in diverse ways. There are also different kinds of antioxidants that are more effective in blocking certain specific free radicals. Selenium and chromium are antioxidants, but these trace elements may not always be included in adequate amounts in the diet, or are difficult to assimilate. Which antioxidants should you take, and what's the best dosage for each one? Can you take too much? Nobody really knows, since this probably varies for each of us, based on age, sex, genetic influences, and stress levels.

There are a variety of specific dietary interventions that can relieve or help prevent particular types of stressful responses. Some people may suffer from reactive hypoglycemia or low blood sugar due to a triggering of insulin production following ingestion of carbohydrates. This can cause sugar craving, depression, weakness and fatigue. It can also stimulate the release of adrenalin, in an attempt to normalize glucose levels, resulting in jitteriness, palpitations, headache, and a variety of symptoms. Eating five or six small meals at spaced intervals, high in protein and low in carbohydrate, may produce gratifying relief. Carbohydrate craving and depression are also commonly seen in

premenstrual syndrome (PMS) and seasonal affective disorder (SAD), which occurs in certain individuals due to lack of adequate exposure to sunlight. All of these disorders have been shown to be associated with similar disturbances in tiny chemical messengers in the brain, known as neurotransmitters. These have profound effects on mood, appetite, cravings for certain foods, sleep, and basic drives. They are significantly influenced by stress, and may mediate many complaints commonly associated with stress.

For example, serotonin is a brain neurotransmitter that has been increasingly linked to a variety of emotional disorders and stress related symptoms. Low serotonin levels seem to be associated with feelings of irritability, frustration, sadness, apathy, insomnia, eating disorders, sexual dysfunction, and lack of energy. When severe or chronic, marked depression may result. Most of the newer and more effective antidepressant drugs, like Prozac, act by blocking the removal of serotonin, so that more is available. Serotonin is not effective when administered orally. The only way it can be manufactured in the body is from tryptophan, an essential amino acid precursor present in most proteins. Because of past problems, possibly due to contamination during the manufacturing process, tryptophan supplements can no longer be sold in health food stores, and require a prescription. The best way to raise or maintain serotonin blood levels, is to increase dietary intake of tryptophan. Some of the foods highest in this are turkey, chicken, sea food, and various nuts. Concentrations of tryptophan and serotonin in the brain can be further specifically raised by the subsequent intake of carbohydrates. This triggers an insulin response that selectively increases the brain concentration of tryptophan over other amino acids, resulting in greater levels of brain serotonin. For some individuals who have difficulty falling asleep, a tryptophan rich diet, followed by eating carbohydrates about an hour before bedtime, may literally provide a one-two knockout punch.

Space does not permit a discussion of the stress-mood-food effects of other neurotransmitters, like melatonin, dopamine, nor-epinephrine, and the endorphins. Some naturally produced substances, like neuropeptide Y, encourage appetite for carbohydrates, and levels rise in the early morning, possibly to encourage carbohydrate intake for quick energy. They fall after eating, when another neuropeptide, galanin, which stimulates appetite for fat, starts to increase. This may explain why most of us don't crave fat in the morning, but start to do so as evening approaches. Dopamine decreases appetite

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for fat and protein, and some newer appetite suppressing drugs act by stimulating dopamine production. Cholecystokinin suppresses appetite for fats and carbohydrates, and is involved in taste perception. In the not too distant future, it is conceivable that we will have cocktail combinations of various neuropeptides and medications that stimulate or block their activities, to take at various times of the day to achieve specific stress reducing effects.

People can also have various stressful reactions to certain foods or chemical additives, dyes and preservatives they contain, because of allergy or sensitivity. Some get severe migraine attacks when they drink red wine, gout after eating purine rich foods, hives from shellfish and nuts, or severe caffeine jitters due to coffee and cola drinks. Other reactions to different foods include headache, itchiness, rashes, sneezing, upset stomach, diarrhea, joint pain, or even circulatory collapse due to anaphylactic shock. Sensitivity to monosodium glutamate is believed to be responsible for the "Chinese Restaurant Syndrome", which can cause throbbing and light headedness, tightness of the muscles of the jaw, neck and shoulders, asthmatic attacks and other disturbing symptoms. While wheat, other grains, and fresh dairy products are desirable dietary constituents, many people must avoid them because of gluten or lactose intolerance. However, these are also highly personalized phenomena, and one man's poison ivy can be another's spinach.

There are numerous other complex interactions between stress and diet. Not being able to stick with a diet is often the result of stresses that stem from work or family problems. That is why various nationwide weight reducing programs are increasingly including and emphasizing a behavioural modification component to help participants recognize and cope with stress in their lives. As indicated, there is no diet that will reduce everyone's stress. However, just making a commitment to follow any regimen that seems appropriate for you, will provide a feeling of control that in itself provides stress reduction benefits.

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

All eating is a kind of proselytizing - a kind of dogmatizing - a maintaining that the eater's way of looking at things is better than the eater's.

..... Samuel Butler
He was a bold man who first swallowed an oyster.
 King James I

SEVENTH ANNUAL "Less Stress" GOLF TOURNAMENT



The Seventh Annual *Less Stress Golf Tournament* was held on August 25, 1994 at The St. Andrew's Golf Club in Hastings-on-Hudson, New York. St. Andrews is the oldest Golf Club in the United States, and was recently redesigned by Jack Nicklaus. In honor of the contributions of The American Institute of Stress and its President, Dr. Paul J. Rosch, Andrew O'Rourke, Westchester County Executive, issued a Proclamation declaring this "Less Stress Day in Westchester", and a similar declaration was made by Mayor Terence Zaleski for the City of Yonkers. The weather was delightful, the reception and the staff at St. Andrews did a superb job of providing elegant dining and service, and the prizes were lavish. The presentation of Awards was particularly enjoyable and lively because of the unanticipated and spontaneous participation of various members of the audience, who could easily have passed for stand up comedians.

The annual *Less Stress Golf Tournament* is now an official MET PGA event, and, as in past years, attracted numerous celebrities, leading sports figures and top area golf Professionals. Shown above are Guido Cribari, former Executive Sports Editor of the Gannett Suburban Newspapers, Dr. Paul J. Rosch, President of The American Institute of Stress, and Bryant Gumbel, co-host of the NBC *Today Show*.

Could a Nose Job Ruin Your Sex Life?

The nose is probably the leading location for cosmetic surgery. It may also be the site of a seventh sense. Although nasal reshaping may make you look better, you might wind up feeling worse, if doctors unwittingly remove the vomero nasal organ (VNO). This is a microscopic structure inside nostril tissue, so named because of its proximity to the vomer bone in the nose. The VNO contains sensory cells that detect specific pheromones emitted by each sex, which have powerful influences on sexual drive and erotic attraction. These tiny chemical substances are excreted in sweat or saliva, and can exert a variety of effects on the behavior of other members of the same species. Some act as signals for alarm, defense, territory or trail marking, while others regulate social status and sexual recognition. Sex attractant pheromones are abundant in the animal kingdom, and are sometimes referred to as "love hormones". Sows are used to detect truffles buried as deep as three feet below the ground, because this delicacy is rich in a steroid very similar to that produced in the sex glands of boars, which is secreted by their salivary glands during pre-mating activities. Its musk-like scent can be detected in infinitesimally dilute concentrations, and some sows go into an uncontrollable frenzy in an attempt to locate its source. A similar compound is produced in the human male testes, and subsequently secreted by the sweat glands.

These molecular stimuli are so minute and odorless, that their presence cannot be identified, much less measured, by sophisticated technologies. They are, however, readily detected by VNO receptors which appear to function in humans much as in other members of the animal kingdom, and even insects. When clove oil and other strong scents were sprayed on VNO sites as well as regular olfactory nerve receptors for odors, the olfactory nerves were markedly stimulated, but there was no VNO response. Conversely, when odorless, concentrated extracts rich in pheromones obtained from skin scrapings were sprayed, the scent detector

nerves showed no evidence of activity. However, nerves carrying impulses from the VNO reacted to as little as one trillionth of an ounce! The VNO is believed to have close connections with the hypothalamus, the part of the brain that regulates relaxation, appetite, anger, fear, and sexual desire. If the VNO is removed in young mice, adolescence is delayed, they fail to mate, and in females, the ovaries may never mature. In one report, subjects exposed to the odorless chemical while being shown pictures of normally dressed women, were asked to rate them for beauty. They consistently awarded higher scores to those viewed while the pheromone was present, than an unexposed, matched, control group. The perfume industry has already promoted "musk" enhanced products, and is actively investigating other potential applications.

While quite prominent in the human fetus, the VNO was previously believed to represent a vestigial organ, since, according to most medical textbooks, it was rarely found in mature individuals. However, a few years ago, a careful study using electron microscopy in more than one hundred adults, was able to identify a VNO in everyone. Its opening was located on both sides of the nasal septum, about 1/2" in from the opening of the nose. It had previously been overlooked, since it is only a quarter inch long tube, and is almost entirely embedded in superficial nasal tissue. Concern has now been expressed about inadvertent removal of the VNO during reconstructive nose surgery. However, not enough data has been collected on post operative patients to confirm such claims, and plastic surgeons do not seem overly concerned about potential malpractice law suits. Some people do seem to be more attractive than others, irrespective of their physical appearance, and possibly pheromones play an important role in promoting unexplained charm and charisma.

Longevity-September 1993

*A great nose indicates a great man
Genial, courteous, intellectual,
Virile, courageous.*

Edmond Rostand
Cyrano de Bergerac (1879)

Lifestyle Changes and Lipid Levels in Women

In the Women's Healthy Lifestyle Project, five hundred healthy, premenopausal women aged 44-50 were randomly selected to participate in an intensive intervention to change their lifestyles, or to serve as matched controls who followed their usual habits. The lifestyle change group embarked on a low fat, low cholesterol diet, along with increased exercise activities designed to reduce weight, or at least keep it from increasing. They attended fifteen group sessions over a twenty week period, during which they were given information about the relationship between dietary fat, cholesterol intake, and heart disease, and instructed in the selection and preparation of low fat foods and meals. Daily caloric intake was limited to about 1300 calories until individual weight loss goals were achieved, and fat intake was limited to 25% of daily calories, with no more than 7% from saturated fat. They were also asked to "burn-up" one thousand calories a week through physical activities equivalent to walking two miles, five days a week. To help achieve this by providing some variety, they were encouraged to engage in bicycling or other aerobic activities in addition to walking, to use stairs whenever possible instead of elevators, and to park further away from entrances if they went shopping or had appointments.

In the first 121 women who were available for a six month assessment, there was a significant drop in cholesterol as well as lowering of low density lipoproteins (bad cholesterol), and an average weight loss of ten pounds. No such changes were seen in the control group, who simply followed their usual routines. Ongoing follow-up is continuing to determine whether these improvements persist over longer periods of time. Some of the benefits noted could be due to the stress buffering effects of group activities that provide social support.

*Internal Medicine News-Cardiology News-
May 1, 1994*

Stress of Sexual Abuse Weakens Immune System

According to a recent report from the National Institutes of Mental Health, abuse in childhood can have significant long term biological consequences and "changes the brain's stress response system". The 7 year study followed 170 girls aged 6-15, half of whom had been sexually abused. Endocrine and immune system function was compared to a control group with no history of such trauma. The abused girls had abnormally high levels of stress hormones which have been shown to cause damage to brain cells crucial for thinking and memory capabilities. In addition, they also demonstrated higher levels of antibodies associated with impairment of immune system function.

Another report of over 400 children and adults who had been sexually or physically abused revealed arrested development of the left hemisphere, which regulates the development of language and logic skills. In contrast, there appeared to be a compensatory earlier maturation of the right hemisphere, which is involved with emotions, particularly those of a negative nature. Differences in brain wave patterns between abused and non-abused children were as significant as those reported in Alzheimer's disease and schizophrenia, when compared to normal controls. The researchers concluded that all sexually abused children should be carefully evaluated for such abnormalities. They also suggested that these might be mitigated by teaching them techniques to develop positive behaviors and improved social relationships.

USA Today-May 25, 1994

Ulcers From Allergies?

Recent research has convincingly shown that most peptic ulcers appear to be due to infection with *Helicobacter Pylori*. As a consequence, treatment of ulcers and related disorders has changed greatly over the past five years, with the best results being obtained through the combined use of antibiotics

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that eradicate this organism. While *H. Pylori* can be recovered from almost all patients with duodenal ulcers and gastritis, it is also found in many individuals with no gastrointestinal symptoms. It now appears that in addition to causing infection, this same organism may be responsible for various allergies, including hay fever, hives, and certain forms of sinusitis. The explanation for this is that the organism is comprised of proteins which can be powerful allergens for some people.

Exposure to *H. Pylori* can be demonstrated through definitive blood tests showing the presence of specific antibodies, reflecting immune system reactivity. In one study of 272 allergy clinic outpatients, 117 showed such positive responses. After the organism was eradicated with antibiotics, some patients showed a marked reduction in antibody titers. As the senior author advised physicians, "If you see a patient who has allergy symptoms—such as rhinitis, hay fever, sinus disease, hives, or exercise-induced anaphylaxis—he should be screened for allergy antibody reactivity to *H. pylori*, especially if he has dyspepsia". The incidence of this infection seems to increase with age, and it is also higher in individuals who live under very crowded conditions. Some researchers believe that close person-to-person contact, such as sharing a bed, may particularly facilitate its spread. Stress has been thought to contribute to ulcers because of increased secretion of hydrochloric acid and digestive enzymes. However, another mechanism may be increased susceptibility to bacterial infection resulting from effects on immune system competency that enhance allergic reactivity.

Modern Medicine 62:14-May 1994

Cautioning Couch Potato Converts

Physical inactivity is a risk factor for heart attacks, and there is abundant evidence that jogging and regular aerobic exercise can confer significant cardiovascular benefits. It has also been observed

that heart attacks occur more frequently during, or after, strenuous physical exertion. However, the same degree of exercise might be arduous and taxing for some, but routine and of little consequence for others. Couch potatoes who are out of shape and want to mend their ways, may now find themselves in a quandary. In a recent study, over 1200 acute heart attack patients were asked about their degree of physical exertion during both the hours before the event, and at other times. A group of 218 matched, healthy controls, were also interviewed. The relative risk for heart attack during the hour following heavy exertion averaged 5.9, ranging from 2.4 in those who exercised at least 5 times weekly, to an astounding 107 in those who pursued vigorous physical activities less than once a week. Similar statistics were obtained in another German study with the same design.

These findings conclusively demonstrate that people who are not physically fit are at increased risk for a heart attack as a result of strenuous exertion to which they are not accustomed. Nevertheless, the statistical likelihood of exercise precipitating a coronary is still relatively minute. For a fifty year old, non-smoking, non-diabetic male, the odds are one in a million. The lesson to be learned is that although regular exercise can improve cardiac function for those who are out of shape, it should be undertaken in a cautious and progressively graded fashion, rather than some sudden macho attempt to sweat away years of previous inactivity. Weekend athletes who skip strenuous exercise activities for three or four weeks in a row might also be at increased risk if they immediately jump right back into their usual routines. The mechanism by which exercise facilitates heart attacks is not clear. However, it could be due to disruption of atherosclerotic plaque by mechanical forces during exercise, resulting from sudden rises in heart rate and blood pressure. In physically fit individuals, these elevations are diminished, along with other sympathetic nervous system activities which promote blood clots, such as platelet stickiness and clumping.

*The New England Journal of Medicine-
December 2, 1993*

Book Reviews • Meetings and Items of Interest

Book Review

Biological Psychology: A Cybernetic Science, F. J. McGuigan, Prentice-Hall Inc., Englewood Cliffs, 1994. 599 pgs. \$42.50

As defined by the author, "Biological Psychology" is "that specialization within psychology for understanding behavior by studying how the systems of the body interact with each other and with the environment". Cybernetics, a term popularized by Norbert Wiener, was derived from κυβερνᾶν the Greek word for "govern" or "steersman", which Plato used to describe the mechanism of piloting ships. It now refers to the science of control and communication through circuits, a good example being the control of room temperature by means of a thermostat, or the speed of a car by cruise control. It is quite clear that numerous brain-body interactions are regulated by feedback circuits, the most obvious being the negative feedback system between the anterior pituitary and its target glands. Similarly, involuntary responses within the body that automatically maintain its temperature and levels of electrolytes and other chemicals within the relatively narrow limits necessary for health and life, operate on similar feedback mechanisms, that underlie the concept of homeostasis. A good example of failure of this regulatory control was provided to Wiener by Dr. Arturo Rosenblueth, Walter Cannon's right hand man, in the form of stress related or "intention tremor", due to cerebellar disturbances. Much less is known about cybernetic mechanisms within the brain and whether or how they modulate behaviors and emotions.

This is a most remarkable book in many ways. It provides a thorough discussion of the biology of mental processes, including how information is accessed, interpreted, integrated and processed, how behaviors are formed and shaped, how we learn and remember, the psychophysiological significance of language and aging, and the cybernetic principles that may govern higher mental processes. Also included are insightful chapters on the origins and treatment of pathological behaviors, and the significance of all these observations for the future of human relations and quality of life. Particularly valuable are the superb diagrams, concise marginal summaries and annotations, comprehensive glossary of

technical terms, detailed background historical information, and References which are complete and current. Each of the 16 chapters is introduced by a detailed outline of its purpose and contents, and concludes with a list of relevant questions and suggested readings, a format which suggests it is aimed primarily at a college or post-graduate student audience. However, it should prove of inestimable value to anyone interested in the origins and mechanisms of behavior and emotions, and the desire to understand these in scientific terms. An extremely attractive presentation that is impossible to do justice to in the space available.

Meetings and Items of Interest

Oct. 30 Problem Solving in Hypertension, Mayo Foundation, Rochester, MN, call (800) 323-2688

Nov. 4-5 Update in Electrocardiography and Arrhythmias sponsored by the Univ. of CA, San Francisco School of Medicine, Ritz-Carlton Hotel, San Francisco, CA, call (415) 476-5208

Nov. 10-13 AABT's 28th Annual Convention "Bridging the Gap from Science to Clinical Practice", Sheraton Harbor Island Hotel, San Diego, CA, call Christina Hennessy (212) 647-1890

Nov. 17-20 41st Annual Meeting, Consultation-Liaison Psychiatry: The Bridge to Primary Care, The Pointe @ Squaw Peak, Phoenix, AZ, call (800) 338-9391

Dec. 5-11 The Psychology of Health, Immunity & Disease sponsored by The National Institute for the Clinical Application of Behavioral Medicine, Hilton Head Island, SC, call NICABM at (800) 743-2226

Dec. 1-4 1994 Annual Meeting sponsored by the Society for Ear, Nose & Throat Advances in Children, Sacramento, CA, call (314) 882-8173

Dec. 8-9 Advances in Treatment of Ischemic Extremities, Northwestern University Medical School, Fairmont Hotel, Chicago, IL, call (312) 503-8533

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