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STRESS, MEMORY LOSS, AND ALZHEIMER'S

The hippocampus is a part of the brain that appears to be critical for both learning and memory. As we get older, the hippocampus shrinks, and learning proficiency and memory skills also deteriorate. Advances in magnetic resonance imaging have made it possible to study the size of the hippocampus and other portions of the brain more accurately. In a report of over 50 individuals aged 55-57, hippocampal size, as well as that of another lobe of the brain not involved with memory were measured, and assessments were also made of overall brain atrophy. Subjects were tested for immediate recall of things recently learned, as well as recall several minutes later.

Researchers found that there was a direct correlation between diminished hippocampal size and a poor ability to recall words and pictures after a few minutes of delay. No correlation was found with hippocampal size and immediate recall, or with shrinkage of other parts of the brain. Some authorities have suggested that hippocampal shrinkage, which can sometimes be as much as 10% of normal size, may represent one of the earliest consistent findings in Alzheimer's disease. If this is corroborated, MRI's might provide an early diagnostic tool.

Some very old people remain quite sharp, while others who are perfectly healthy in other respect, become progressively forgetful. As noted previously, there are numerous links between stress and the aging process. Both have been defined as "the rate of wear and tear" on the body. A recent report suggests that stress may also be responsible for the memory loss seen as we grow older. One hundred thirty healthy volunteers aged 55-87 were followed for 5 years, during which blood concentrations of the stress hormone, cortisol, were measured. The subjects were also tested for cognitive skills by a psychiatrist who was unaware of their hormonal status. Increased cortisol was positively correlated with subtle memory loss, as well as concentrating abilities. People with very high concentrations of cortisol were able to remember things they had learned long ago, but not what they were told a few minutes previously. This is characteristic of the memory loss associated with old age, and similar to the deficit which accompanies hippocampal shrinkage. How much stress and/or cortisol contributes to hippocampal damage and Alzheimer's disease, remains to be delineated.

Science News-November 27, 1993

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The Newsletter of
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Paul J. Rosch, M.D., F.A.C.P.
Editor-in-Chief

Spitting, Testosterone, and Violent Behavior

Two thousand years ago, Pliny the Elder wrote "All men possess in their bodies a poison which acts upon serpents; and the human saliva, it is said, makes them take to flight, as though they had been touched with boiling water. The same substance, it is said, destroys them the moment it enters their throat." According to the Oxford English Dictionary, the verb spit originally meant "to eject saliva (on a person) as a sign of contempt". Spitting is predominantly a male habit, and in the last century, contests were often held to see who could spit the greatest distance or with the most accuracy. Presumably, proficiency in this regard waa a sign of greater masculinity. The Romans believed that saliva had mystical characteristics and properties that were also tied to manliness, and modern science appears to be confirming this.

Samples of saliva are surprisingly easy to obtain and analyze, since they do not require venipuncture or any invasive procedure, can be stored for long periods of time without deterioration, and various measurement techniques are fairly well standardized. Salivary testosterone levels are an accurate and convenient way to measure androgenic activities, and are attracting increased attention. High levels of testosterone are associated with a tendency towards a deeper voice, baldness, but more body hair, and increased muscle mass. In addition to these physical findings, high testosterone seems to be linked with other male traits, such as increased competitiveness, aggressiveness, and hostility. Some researchers believe that they may also favor the development of behaviors that promote violence and crime, and studies in prisoners support this. Expressed in nanograms per deciliter, average male values are in the range of 8 to 10, but criminals may have levels of 17 or more. In females, testosterone is produced in small amounts in the ovaries and adrenals, at levels of 1 to 2, with violent female prisoners generally having readings of 3 to 4. Studies in different occupational groups reveal higher levels not only in criminals, but also in attorneys, cold-call salesmen, and people who have lost their jobs and remain unemployed. Clergy, farmers, and white collar managers are at the lower end of the spectrum, and ministers fall in the 5-6 range.

Aggressive courtroom lawyers have particularly higher than normal levels, especially if they have a tendency to yell, pound, and jump up and down. This also holds true for female attorneys. If these traits are associated with greater or lesser success in legal battles, or in other occupations, it is not inconceivable that salivary testosterone testing could become part of pre-employment evaluations.

Wall Street Journal-November 29, 1993

Sex and Heart Attacks

Cardiac patients are traditionally told to avoid certain activities that can precipitate an acute heart attack. The traditional warnings are to avoid strenuous activities, like shoveling snow, straining to have a bowel movement, and sex. These are all associated with what is known as the Valsalva maneuver, or forced expiration against a closed glottis. This can cause a marked elevation of blood pressure, and also put strain on the heart. (In experienced weight lifters who perform the extreme Valsalva maneuver during maximum exer-

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tion, systolic blood pressures of 400/250 have been recorded.) Heart attacks tend to occur more often in the early morning hours, when blood clotting tendencies are greatest, and strenuous activity and sex should probably be avoided between 6 and 11 a.m.

Over 1700 hospitalized patients recovering from a heart attack were asked to recall what they were doing in the two hours before the first signs and symptoms of the event. Sexual activity or simply getting out of bed in the morning, appeared to double the risk for heart attack. In patients with a history of heart attack, the likelihood of a subsequent event in any one hour was approximately 10 in 1 million. Although the risk of having a heart attack within two hours after having sex doubled, the chances were still only 20 in 1 million. Many partners of heart attack victims are concerrned about engaging in sexual activity, because of anecdotal reports of famous people who "died in the saddle". While this is not entirely incorrect, it is important to point out that the absolute risk is extremely low, and not any greater than simply getting out of bed in the morning. Obviously, the duration and intensity of sexual activity is also an important factor, although this was not evaluated in the report.

Science News-November 27, 1993

If our elaborate and dominating bodies are given us to be denied at every turn, if our nature is always wrong and wicked, how ineffectual we are -- like fishes not meant to swim.

Cyril Connolly

Working Women, Stress, and Health

Over the past three decades, there has been a phenomenal increase in the number of women who have entered the work force. In 1960, a little more than 1 out of 3 women aged 18-64 were workers, compared to almost 2 out of 3 in 1990. Various surveys confirm that job pressures are far and away the leading source of stress for adult Americans. Concern has been expressed that many female workers who have the added stress of homemaking and child rearing responsibilities, might be even more likely to suffer from stress related disorders. A recent study reported on 10,000 working women and approximately 3,500 unemployed controls in the age group noted above. Although the workers reported higher levels of stress (75% compared to 60%), they actually tended to have lower blood pressure and cholesterol levels, and less obesity. This would tend to put them at less risk for cardiovascular disease, although prior research did disclose significantly higher heart attack rates in certain classes of working women. Previous studies also reported that working women were likely to smoke and drink more than homemakers, but no significant difference was apparent in this survey. Non workers tended to have more hypertension, higher cholesterols, and generally poorer health records.

One explanation for this may be that working women have more access to health assistance information and support. In 1985, 3 out of 4 corporations with 50 or more employees had health promotion programs. Today the figure is over 90%. The most popular components of such employee assistance programs are stress management, smoking cessation, accident prevention, and weight control. Some organizations also offer discounts to employees who join health clubs or YMCA type programs. The study's senior author concluded that "employed women need more emphasis on stress reduction, while unemployed women need more emphasis on cholesterol, blood pressure lowering, and weight reduction".

Medical Tribune-November 25, 1993

Perhaps the greatest social service that can be rendered by anybody to the country and to mankind is to bring up a family. But here again, because there is nothing to sell, there is a very general disposition to regard a married woman's work as no work at all, and to take it as a matter of course that she should not be paid for it.

George Bernard Shaw

Stress and Lack of Friends Reduce Life Expectancy

As indicated in prior abstracts, a variety of studies show that strong social support from family or friends is a powerful stress buffer. Further proof comes from a recent Swedish report demonstrating that middle aged men who had recently endured high levels of emotional stress, but had little emotional support, were three times more likely to die over the next seven years, than those with close personal ties. A random sample of 50 year old men underwent a thorough physical examination and psychological evaluation. The latter included listing recent stressful life events, as well as ratings of the degree of emotional support available from relatives and friends. Seven years later, official records were searched to determine mortality during the intervening period.

Of those who had reported significant upsetting life events, 11% had died. All had identified themselves as lacking family or social support. In men reporting few disturbing life events, the death rate was only 3%. Stressful life events most strongly related to mortality included having serious concerns about a family member, being forced to move, feelings of insecurity at work, serious financial problems, and legal difficulties. Researchers indicate that this suggests that although stress can lower resistance to illness, that this can be offset by strong, positive emotional relationships. How a strong social network helps to protect health is not clear. One explanation is that people with many close social ties tend to lead healthier lifestyles. On the other hand, such benefits may be mediated through more subtle neuroendocrine and immune system pathways. A prior California study involving 7,000 men and women, found that after nine years, those with the fewest social ties, were twice as likely to die as those with the strongest ones. As one authority commented "friends and family help you put your stress in perspective".

New York Times-December 7, 1993

"I keep my friends as misers do their treasure, because, of all the things granted us by wisdom, none is greater or better than friendship."

Pietro Aretino

Stress, Social Support, and Heart Attacks

The contributory role of emotional distress to heart attacks has been increasingly recognized, and stress reduction strategies and behavioral modification are increasingly being utilized as part of overall treatment strategy. As indicated in the preceding article, an important facet of this appears to be how the individual relates to others, and particularly the availability and utilization of social support buffers. In recent years, there has been growing emphasis on the hostility component of Type A behavior as the most significant predictor of adverse coronary events. Some have suggested that this may be related to the tendency for hostile individuals to have fewer close social ties.

In support of this, it has been shown that Type A's rated as socially isolated, had almost four times higher death rates than Type A controls with split social support. Even socially isolated Type B's had twice the death rate of other Type B cardiac patients. One report indicates that social activity can predict cardiac mortality as strongly as elevated cholesterol and serum lipid patterns, or even electrocardiographic evidence of cardiac irritability in Type A patients.

Your Patient and Fitness, 7:11, 1993
Psychosomatic Medicine, 52:59-72,1990

Is it Stress or MCS?

It's estimated that there are thousands of Americans labeled as hypochondriacs or suffering from stress, who are really victims of Multiple Chemical Sensitivity (MCS). Common complaints are erratic headaches, rashes, weakness, allergies, and breathing problems, for which no cause can be found. One such patient had visited various specialists for sev-

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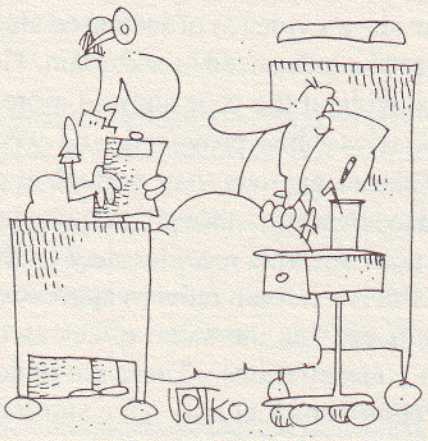
eral years without relief, until his pet rabbit led to the correct diagnosis. There were several cotton throw rugs on top of the synthetic wall to wall carpeting in his apartment, and he noted that the rabbit always sat on those rugs and "avoided the carpet like the plague". Subsequent research revealed that the synthetic materials in his carpet contained a variety of chemicals that could reproduce all his symptoms. When he moved to a new apartment without carpeting and replaced all the synthetic slip covers and drapes with natural ones, his headaches, rashes and difficulty in breathing completely disappeared. MCS can be triggered by exposure to numerous chemicals, including pesticides, glues, formaldehyde, volatile organic compounds, and all sorts of substances in the air we breathe, clothes we wear, water we drink, and the buildings we live and work in.

Although MCS has not been widely accepted by the medical profession, two years ago, a National Academy of Sciences workshop defined the illness as a syndrome in which amounts of various chemicals that cause no problems for most people, can make others quite ill. A variety of organs can be affected, as well as the central nervous and immune systems. However, it may be difficult to prove cause-effect relationships. Some individuals who work in places where they are constantly exposed to low levels of synthetic chemicals reach a threshold, and it is only then that they suddenly start to develop symptoms. Others, who may be exposed to a large amount of one chemical which is toxic for them, may subsequently become sensitive to many different substances, including some that previously posed no problem, such as, "perfumes, cleaning agents, and the coatings on paper". It is believed that a brief but massive exposure to toxic chemicals may have triggered MCS in hundreds of soldiers who fought in the Persian Gulf War, and are now suffering from chronic rashes, aches, and fevers. According to government scientists, one of the likely causes may have been daily exposure to the toxic fumes from the oil fields set on fire in Kuwait.

Of the more than 70,000 compounds presently in commercial use, only a few hundred have been tested thoroughly for human health effects, and more than 1,000 new chemicals are introduced each year. The problem is that it is difficult to screen compounds that might affect humans, since this depends on individual susceptibility and sensitivity. Because of growing public concern, the National Toxicology Program began conducting experiments three years ago on the ground water near hazardous waste sites. Rats and mice were exposed to heavy metals and other chemicals commonly present in such situations and subsequently showed evidence of immune system dysfunction, chromosomal damage, and toxic effects on liver and bone marrow. A bill known as the Persian Gulf War Legislation has been introduced to require the Veteran's Administration to conduct research on chemical sensitivities in affected individuals.

Risk of MCS can be reduced by avoiding exposure to tobacco smoke, which contains irritating chemicals other than nicotine. Synthetic home furnishings are a major problem, and some of the most polluting things in the home are furniture made from pressboard, since this contains formaldehyde. Carpeting, can also release volatile organic compounds that can be very irritating. Since synthetic chemicals may promote oxidative stress, taking anti-oxidant vitamins, C, E, and beta carotene, could provide some protection. According to a staff physician at the Environmental Health Center in Dallas, which specializes in treating environmental illnesses, raising your metabolic rate accelerates the removal of toxic chemicals from your body. Therefore, regular aerobic exercise should be another good defense.

Longevity-November 1993



"All your tests are back and they show you are allergic to tests."

Stress, Serotonin and Aggression

Aggression and hostility are assuming increased importance as contributors to cardiovscular and other stress related disorders. The neuroendocrine or biochemical roots of aggression are not clear, but there is considerable evidence that serotonin plays an important role. Some individuals with a pathologic degree of aggression have been shown to have low brain serotonin levels, but whether this is cause or effect is difficult to determine. Serotonin is a neurotransmitter that is involved in a complex range of emotions ranging from depression to hostility. The problem is that studying serotonin is complicated, since serum levels do not necessarily reflect physiologic states. Serotonin's clinical effects are determined by activities at receptor sites. Researchers have therefore increasingly focused on studying drugs which affect serotonin uptake and re-uptake at the 14 different receptor sites that are currently known to exist. Unfortunately, very few drugs selectively activate or inactivate just one type of receptor, making it difficult to separate various actions.

In a novel approach, French researchers developed strains of mice which lacked the gene for one of each of the different receptor sites for serotonin, and evaluated them for behavioral abnormalities. They hit paydirt on the first try. Their target was the 5HT1b serotonin receptor which is found in several parts of the mouse brain, and particularly the limbic system, which governs emotion. Mice who lack the receptor seem to eat, breed and develop normally, and do not show evidence of increased anxiety, all of which can be influenced by serotonin. However, male mice without the gene showed more aggressive tendencies when provoked, and were much less fearful and anxious than normal mice when subjected to stress even though their serotonin levels were normal. This receptor may be the target through which serotonin reduces aggression, since knocking it out has the same effect as reducing serotonin concentrations. There are undoubtedly other receptor sites that may have similar properties, and there is no evidence that genetic defects of this nature play a role in human aggression, but this is being investigated. However, these observations may lead to the development of new effective drugs to reduce hostility and aggressive behavior.

Science-November 19, 1993

Noise Stress and Type A Behavior

Individuals often respond to an identical stressful situation, threat, or challenge in quite different ways. Prior experiences, personality, coping skills, and numerous other factors may all shape our reactions. Type A's usually overreact to challenges and stressful situations, and have greater rises in blood pressure and heart rate under such circumstances. However, this may depend upon the nature of the stressor, as well as the general level of tension the individual is already experiencing.

To evaluate this, men employed in a heavy machinery workshop were monitored to study the effects of noise exposure on cardiovascular responses, and were rated for Type A characteristics. On a typical day they were exposed to varying noise levels ranging from low and average, to greater than 80 decibels. Blood pressure, heart rate, and general levels of tension, were also measured. Resting heart rate and blood pressure was found to be approximately the same for both Type A and Type B workers, and there was no significant difference during exposure to low and average noise levels. However, Type A's exhibited significantly greater rises in both blood pressure and heart rate when noise levels were high. In general, Type A individuals reported higher levels of tension while at work than Type B's, and the combination of high tension levels and marked Type A behavior was associated with the greatest elevations in blood pressure.

In general, the degree of tension was also positively correlated with heart rate and blood pressure. This suggests that although individuals may have difficulty in recognizing or distinguishing between their emotions, the feeling of tension ap-

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pears to be a good indication of sympathetic nervous system activity. Noise stress has been linked to a variety of psychological and physical problems, including insomnia, depression, hypertension, and heart attacks. It would now appear that in addition to personality and prior experience, existing tension levels may play a significant role in determining the severity of these responses.

Psychosomatic Medicine, Vol. 55, 185, 1993

Noise is the most impertinent of all forms of interruption. It is not only an interruption, but also a disruption of thought.

Arthur Schopenhauer

Celebrity Stress

Famous people, like movie, TV, and top musical stars have unique stresses in their lives that are often not appreciated. For many, privacy is severely compromised, and personal safety for themselves and loved ones may be such an issue, that it is often necessary to hire bodyguards for 24 hour coverage. In addition, frequent travel, and social and professional obligations, may allow little time to develop close personal and family ties, and this may be particularly difficult for their children to cope with. Occupational demands include the stresses of constant competition, persistent need to maintain high performance standards, problems with media critics, threatening letters and phone calls, etc. They tend to travel in the fast lane, and may be particularly susceptible to promiscuity, alcoholism, and substance abuse, because of peer pressure and personal wealth that allows them to purchase almost anything.

Some try to cope by practicing stress reduction measures such as meditation, talking with a therapist, hiring a personal masseur, regular exercise, and engaging in hobbies or religious activities. However, it is difficult to get celebrities to talk about their stress related problems and how they deal with them. One distinguished Professor who specializes in stress and trauma research has been able to collect information on 46 stars and their families, and hopes to eventually include 300 in his study. While some do cooperate, he notes that many others "don't trust me - or any researcher - but they will benefit from what I do."

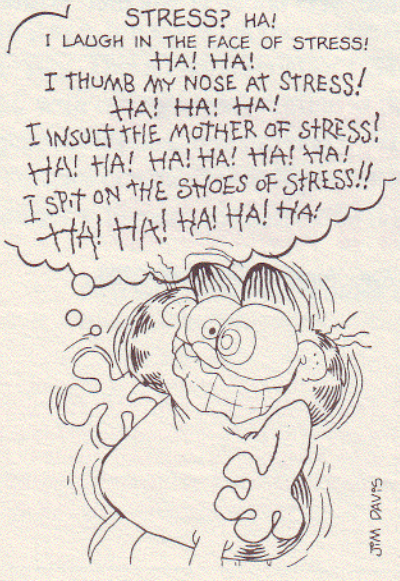
USA Today-3/6/94

Laughing Off Job Stress

Being a "humor consultant" for big business has become a big business itself. Corporations are increasingly employing such individuals to help reduce employee stress and burnout. Some of their suggestions include putting cartoon bulletin boards near elevators, showing funny videotapes in staff lounges, keeping props on desks like medicine bottles labeled " Extra Strength Screw-It All", or having managers wear buttons saying, "Save Time: Do It My Way". The Institute for the Advancement of Human Behavior sponsored a four day conference on *The Power Of Laughter And Play* . A special event entitled *"Healing Entertainers and Entertaining Healers"* featured comics Sid Caesar and Steve Allen, as well as their physician sons, who teach juggling and other "feel happy" techniques to clients.

This year's Humor Project's *Power of Positive Humor and Creativity Conference* is expected to draw over 1,000 managers, educators and others interested in this subject. As its organizer noted, "Everyone uses the expression 'Someday we'll laugh about this.' Why wait?"

Wall Street Journal-3/22/94



Book Reviews • Meetings and Items of Interest

Book Review

Cardiovascular Reactivity And Stress: Patterns of Physiologic Response, Turner, J.R., Plenum, New York, 1994. 231 pgs. $34.50

This volume addresses the important and controversial subject of the significance of cardiovascular reactivity to stress. Increases in blood pressure and heart rate in response to diverse but standardized stressors can vary tremendously, depending upon genetic, environmental, neuroendocrine and nutritional influences, prior experience, coping skills, and various other factors. So what? Is there any evidence that the magnitude of blood pressure or heart rate increase due to stress has any clinical significance? Are excessive responses dangerous? Are they predictive of a greater likelihood of developing fixed hypertension, coronary heart disease, or accelerated atherosclerosis? It is generally believed that one or more of these assumptions is correct. However, there is scant evidence to support any of the above. The cold pressor test has been around for over seven decades, but there is no proof that even hyperreactivity to this stressor has any prognostic significance.

The increasing availability of ambulatory monitoring has provided considerable information on cardiovascular reactivity to stress in real life situations as opposed to the laboratory setting. These studies show that the greatest rises in blood pressure are apt to occur while individuals are talking, particularly about controversial subjects over the telephone. In that regard, although speech tasks are discussed, there was surprisingly no reference to the seminal work of Lynch and coworkers, demonstrating that the content of speech, its rate, volume, baseline blood pressure, the relative social status of the audience, and other psychosocial environmental considerations all influenced the magnitude of the response. It is not clear whether "white coat hypertension" is as benign as originally thought. However, even if it can be linked to a higher incidence of subsequent sustained hypertension or coronary heart disease, this may be an associated, rather than causative relationship. This book provides a comprehensive discussion of the complex issues involved in the evaluation of cardiovascular reactivity to stress, and is highly recommended to anyone interested in this subject.

Meetings and Items of Interest

April 13 Superhighways for Disease: Shared Determinants of Health Outcomes, Dr. Philip R. Lee, Asst. Sec. of Health, keynote speaker, Boston Park Plaza Hotel, Boston, MA (202) 775-8826

April 13-16 Fifteenth Anniversary Meeting, "Cross-Cutting Dimensions of Behavioral Medicine: Visions for the Future", Park Plaza Hotel, Boston, MA, Contact Laura Hayman (301) 251-2790

April 15-17 9th Annual International Conference on The Positive Power of Humor & Creativity, Surviving and Thriving in the 90's, Saratoga Springs, NY, for info (518) 587-8770

April 24 Women's Healthcare: Clinical Perspectives in Natural Medicine, The Stamford Marriott Hotel, Stamford, CT, (206) 623-2520

April 26 Recent Advances in Acupuncture Research, The Center for Frontier Sciences Spring, 1994, Colloquia, Temple University, Philadelphia, PA, call (215) 204-8487

April 28-May 1 Children: Our Ultimate Investment, The Celebration of the Birth Centenary of Aldous Huxley, Wilshire Ebell Theatre, Los Angeles, CA, (213) 461-8976

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