

Stress

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WHAT IS STRESS?

The stress response of the body is somewhat like an airplane readying for take-off. Virtually all systems (eg, the heart and blood vessels, the immune system, the lungs, the digestive system, the sensory organs, and brain) are modified to meet the perceived danger.

External and Internal Stressors

People can experience either external or internal stressors.

- External stressors include adverse physical conditions (such as pain or hot or cold temperatures) or stressful psychological environments (such as poor working conditions or abusive relationships). Humans, like animals, can experience external stressors.
- Internal stressors can also be physical (infections, inflammation) or psychological. An example of an internal psychological stressor is intense worry about a harmful event that may or may not occur. As far as anyone can tell, internal psychological stressors are rare or absent in most animals except humans.

Acute or Chronic Stress

Stressors can also be defined as short-term (acute) or long-term (chronic).

Acute Stress. Acute stress is the reaction to an immediate threat, commonly known as the ***fight or flight*** response. The threat can be any situation that is experienced, even subconsciously or falsely, as a danger.

Common acute stressors include:

- noise,
- crowding,

- isolation,
- hunger,
- danger,
- infection, and
- imagining a threat or remembering a dangerous event.

Under most circumstances, once the acute threat has passed, the response becomes inactivated and levels of stress hormones return to normal, a condition called the *relaxation response*.

Chronic Stress. Frequently, however, modern life poses on-going stressful situations that are not short-lived and the urge to act (to fight or to flee) must be suppressed. Stress, then, becomes chronic. Common chronic stressors include:

- on-going highly pressured work,
- long-term relationship problems,
- loneliness, and
- persistent financial worries.

WHAT IS THE EFFECT OF ACUTE STRESS?

The best way to envision the effect of acute stress is to imagine oneself in a primitive situation, such as being chased by a bear.

The Brain's Response to Acute Stress

In response to seeing the bear, a part of the brain called the *hypothalamic-pituitary-adrenal* (HPA) system is activated.

Release of Steroid Hormones. The HPA systems trigger the production and release of steroid hormones (*glucocorticoids*), including the primary stress hormone *cortisol*. Cortisol is very important in marshaling systems throughout the body (including the

heart, lungs, circulation, metabolism, immune systems, and skin) to deal quickly with the bear.

Release of Catecholamines. The HPA system also releases certain neurotransmitters (chemical messengers) called ***catecholamines***, particularly those known as ***dopamine***, ***norepinephrine***, and ***epinephrine*** (also called adrenaline).

- Catecholamines activate an area inside the brain called the ***amygdala***, which apparently triggers an emotional response to a stressful event. (In the case of the bear, this emotion is most likely fear.)
- Neurotransmitters then signal the ***hippocampus*** (a nearby area in the brain) to store the emotionally loaded experience in long-term memory. In primitive times, this combination of responses would have been essential for survival, when long-lasting memories of dangerous stimuli (ie, the large bear) would be critical for avoiding such threats in the future.
- During a stressful event, catecholamines also suppress activity in areas at the front of the brain concerned with short-term memory, concentration, inhibition, and rational thought. This sequence of mental events allows a person to react quickly to the bear, either to fight or to flee from it. (It also hinders the ability to handle complex social or intellectual tasks and behaviors.)

Response by the Heart, Lungs, and Circulation to Acute Stress

As the bear comes closer, the heart rate and blood pressure increase instantaneously.

- Breathing becomes rapid and the lungs take in more oxygen.
- Blood flow may actually increase 300% to 400%, priming the muscles, lungs, and brain for added demands.
- The spleen discharges red and white blood cells, allowing the blood to transport more oxygen.

The Immune System's Response to Acute Stress

The effect on the immune system from confrontation with the bear is similar to marshaling a defensive line of soldiers to potentially critical areas.

- The steroid hormones dampen parts of the immune system, so that infection fighters (including important white blood cells) or other immune molecules can be redistributed.
- These immune-boosting troops are sent to the body's front lines where injury or infection is most likely, such as the skin, the bone marrow, and the lymph nodes.

The Acute Response in the Mouth and Throat

As the bear gets closer, fluids are diverted from nonessential locations, including the mouth. This causes dryness and difficulty in talking. In addition, stress can cause spasms of the throat muscles, making it difficult to swallow.

The Skin's Response to Acute Stress

The stress effect diverts blood flow away from the skin to support the heart and muscle tissues. (This also reduces blood loss in the event that the bear catches up.) The physical effect is a cool, clammy, sweaty skin. The scalp also tightens so that the hair seems to stand up.

Metabolic Response to Acute Stress

Stress shuts down digestive activity, a nonessential body function during short-term periods of physical exertion or crisis.

The Relaxation Response: the Resolution of Acute Stress

Once the threat has passed and the effect has not been harmful (ie, the bear has not eaten or seriously wounded the human), the stress hormones return to normal. This is known as the *relaxation response*. In turn, the body's systems also normalize.

WHAT ARE THE NEGATIVE EFFECTS OF STRESS?

In prehistoric times, the physical changes in response to stress were an essential adaptation for meeting natural threats. Even in the modern world, the stress response can

be an asset for raising levels of performance during critical events such as a sports activity, an important meeting, or in situations of actual danger or crisis. If stress becomes persistent and low-level, however, all parts of the body's stress apparatus (the brain, heart, lungs, vessels, and muscles) become chronically over- or under-activated. This may produce physical or psychologic damage over time. Acute stress can also be harmful in certain situations.

Stress-related conditions that are most likely to produce negative physical effects include:

- An accumulation of persistent stressful situations, particularly those that a person cannot easily control (for example, high-pressured work plus an unhappy relationship).
- Persistent stress following a severe acute response to a traumatic event (such as an automobile accident).
- An inefficient or insufficient relaxation response.
- Acute stress in people with serious illness, such as heart disease.

Psychologic Effects of Stress

Studies suggest that the inability to adapt to stress is associated with the onset of depression or anxiety. In one study, two-thirds of subjects who experienced a stressful situation had nearly six times the risk of developing depression within that month. Some evidence suggests that repeated release of stress hormone produces hyperactivity in the hypothalamus-pituitary-adrenal axis and disrupts normal levels of serotonin, the nerve chemical that is critical for feelings of well-being. Certainly, on a more obvious level, stress diminishes the quality of life by reducing feelings of pleasure and accomplishment, and relationships are often threatened.

Heart Disease

Mental stress is as major a trigger for angina as physical stress. Incidents of acute stress have been associated with a higher risk for serious cardiac events, such as heart rhythm abnormalities and heart attacks, and even death from such events in people with heart disease.

Stress activates the sympathetic nervous system (the automatic part of the nervous system that affects many organs, including the heart). Such actions and others may negatively affect the heart in several ways:

- Sudden stress increases the pumping action and rate of the heart and causes the arteries to constrict, thereby posing a risk for blocking blood flow to the heart.
- Emotional effects of stress alter the heart rhythms and pose a risk for serious arrhythmias in people with existing heart rhythm disturbances.
- Stress causes blood to become stickier (possibly in preparation of potential injury), increasing the likelihood of an artery-clogging blood clot.
- Stress may signal the body to release fat into the bloodstream, raising blood-cholesterol levels, at least temporarily.
- In women, chronic stress may reduce estrogen levels, which are important for cardiac health.
- Stressful events may cause men and women who have relatively low levels of the neurotransmitter serotonin (and therefore a higher risk for depression or anger) to produce more of certain immune system proteins (called *cytokines*), which in high amounts cause inflammation and damage to cells, including possibly heart cells.
- Recent evidence confirms the association between stress and hypertension (high blood pressure). People who regularly experience sudden increases in blood pressure caused by mental stress may, over time, develop injuries in the inner lining of their blood vessels. In one 20-year study, for example, men who periodically measured highest on the stress scale were twice as likely to have high blood pressure as those with normal stress. The effects of stress on blood pressure in women were less clear.

More research is needed to confirm the actual harm of stress on the heart. For example, one study of people who work under demanding conditions suggested that heart disease, including high blood pressure, attributed to work stress may simply be due to the way people cope with the stress. People who are trying to deal with stress often resort to unhealthy habits including high-fat and high-salt diets, tobacco use, alcohol abuse, and a

sedentary lifestyle. In one study, men were more apt to use alcohol or eat less healthily in response to stress, while women tended to have healthier ways of coping.

Stroke

One survey revealed that men who had a more intense response to stressful situations, such as waiting in line or problems at work, were more likely to have strokes than those who did not report such distress. In some people prolonged or frequent mental stress causes an exaggerated increase in blood pressure. In fact, a 2001 study has linked for the first time a higher risk for stroke in adult Caucasian men and elevated blood pressure during times of stress.

Susceptibility to Infections

Chronic stress appears to blunt the immune response and increase the risk for infections and may even impair a person's response to immunizations. A number of studies have shown that subjects under chronic stress have low white blood cell counts and are vulnerable to colds. And once any person catches a cold or flu, stress can exacerbate symptoms. People who harbor herpes or HIV viruses may be more susceptible to viral activation following exposure to stress. Even more serious, some research has found that HIV-infected men with high stress levels progress more rapidly to AIDS when compared to those with lower stress levels. (In some studies, stressful events most linked with a higher incidence of infections were interpersonal conflicts, such as those at work or in a marriage.)

Immune Disorders

The contradictory effects of stress on the immune system can have mixed effects on autoimmune diseases (which are those that are caused by inflammation and damage from immune attacks on the body). For example, eczema, lupus, and rheumatoid arthritis may demonstrate changes ranging from improvement to deterioration in response to stress. A 2001 study reported that short-term stress appears to have no negative effect on multiple sclerosis, but chronic stress is a major risk factor for flare-ups.

Cancer

Current evidence does not support the idea that stress causes cancer. Nevertheless, some animal studies suggest that lack of control over stress (not simply stress itself) had

negative effects on immune function and contributed to tumor growth. And, two small studies on melanoma and breast cancer patients reported improved survival with therapies that offered emotional support. Other research has not detected similar survival benefits, but support groups still have great value in reducing stress in patients with terminal cancer.

Gastrointestinal Problems

The brain and the intestine are strongly related and mediated by many of the same hormones and nervous system. (Indeed, some research suggests that the gut itself has features of a primitive brain.) It is not surprising then that prolonged stress can disrupt the digestive system, irritating the large intestine and causing diarrhea, constipation, cramping, and bloating. Excessive production of digestive acids in the stomach may cause a painful burning.

Irritable Bowel Syndrome. Irritable bowel syndrome (or spastic colon) is strongly related to stress. With this condition, the large intestine becomes irritated, and its muscular contractions are spastic rather than smooth and wave like. The abdomen is bloated and the patient experiences cramping and alternating periods of constipation and diarrhea. Sleep disturbances due to stress can further exacerbate irritable bowel syndrome.

Peptic Ulcers. It is now well established that most peptic ulcers are either caused by the *H. pylori* bacteria or by the use of nonsteroidal anti-inflammatory (NSAID) medications (such as aspirin and ibuprofen). Nevertheless, studies still suggest that stress may predispose someone to ulcers or sustain existing ulcers. Some experts, in fact, estimate that social and psychologic factors play some contributing role in 30% to 60% of peptic ulcer cases, whether they are caused by *H. pylori* or NSAIDs. In any case, some experts believe that the anecdotal relationship between stress and ulcers is so strong that attention to psychological factors is still warranted.

Inflammatory Bowel Disease. Although stress is not a cause of inflammatory bowel disease (Crohn's disease or ulcerative colitis), there are reports of an association between stress and symptom flare-ups. One study, for example, found that while short term (past month) stress did not significantly exacerbate ulcerative colitis symptoms, long term perceived stress tripled the rate of flare-ups compared to patients who did not report feelings of stress.

Eating Problems

Stress can have varying effects on eating problems and weight.

Weight Gain. Often stress is related to weight gain and obesity. Many people develop cravings for salt, fat, and sugar to counteract tension and, thus, gain weight. Weight gain can occur even with a healthy diet, however, in some people exposed to stress. And the weight gained is often abdominal fat, a predictor of diabetes and heart problems. In a 2000 study, lean women who gained weight in response to stress tended to be less able to adapt to and manage stressful conditions. The release of cortisol, a major stress hormone, appears to promote abdominal fat and may be the primary connection between stress and weight gain in such people.

Weight Loss. Some people suffer a loss of appetite and lose weight. In rare cases, stress may trigger hyperactivity of the thyroid gland, stimulating appetite but causing the body to burn up calories at a faster than normal rate.

Eating Disorders. Anorexia nervosa and bulimia nervosa are eating disorders that are highly associated with adjustment problems in response to stress and emotional issues.

Diabetes

Chronic stress has been associated with the development of insulin-resistance, a condition in which the body is unable to use insulin effectively to regulate glucose (blood sugar). Insulin-resistance is a primary factor in diabetes. Stress can also exacerbate existing diabetes by impairing the patient's ability to manage the disease effectively.

Pain

Researchers are attempting to find the relationship between pain and emotion, but the area is complicated by many factors, including effects of personality types, fear of pain, and stress itself.

Muscular and Joint Pain. Chronic pain caused by arthritis and other conditions may be intensified by stress. (According to a study on patients with rheumatoid arthritis, however, stress management techniques do not appear to have much effect on arthritic pain.) Psychologic distress also plays a significant role in the severity of back pain. Some studies have clearly associated job dissatisfaction and depression to back problems, although it is still unclear if stress is a direct cause of the back pain.

Headaches. Tension-type headache episodes are highly associated with stress and stressful events. (Sometimes the headache doesn't even start until long after a stressful event is over.) Some research suggests that tension-type headache sufferers may actually have some biological predisposition for translating stress into muscle contraction. Among the wide range of possible migraine triggers is emotional stress (although the headaches often erupt after the stress has eased). One study suggested that women with migraines tend to have personalities that over-respond to stressful situations.

Sleep Disturbances

The tensions of unresolved stress frequently cause insomnia, generally keeping the stressed person awake or causing awakening in the middle of the night or early morning.

Sexual and Reproductive Dysfunction

Sexual Function. Stress can lead to diminished sexual desire and an inability to achieve orgasm in women. Stress response can also cause temporary impotence in men. Part of the stress response involves the release of brain chemicals that constrict the smooth muscles of the penis and its arteries. This constriction reduces the blood flow into and increases the blood flow out of the penis, which can prevent erection.

Premenstrual Syndrome. Some studies indicate that the stress response in women with premenstrual syndrome may be more intense than in those without the syndrome.

Fertility. Stress may even affect fertility. Stress hormones have an impact on the hypothalamus gland, which produces reproductive hormones. Severely elevated cortisol levels can even shut down menstruation. One interesting small study reported a significantly higher incidence of pregnancy loss in women who experienced both high stress and prolonged menstrual cycles. Another reported that women with stressful jobs had shorter periods than women with low-stress jobs.

Effects on Pregnancy. Old wives' tales about a pregnant woman's emotions affecting her baby may have some credence. Maternal stress during pregnancy has been linked to a 50% higher risk for miscarriage. It is also associated with lower birth weights and increased incidence of premature births, both of which are risk factors for infant mortality. One study suggested that stress experienced by expectant mothers can even influence the way in which the baby's brain and nervous system will react to stressful events. Stress may cause physiologic alterations, such as increased adrenal hormone

levels or resistance in the arteries, that may interfere with normal blood flow to the placenta.

Memory, Concentration, and Learning

Stress has significant effects on the brain, particularly on memory. The typical victim of severe stress suffers loss of concentration at work and at home and may become inefficient and accident-prone. In children, the physiologic responses to stress can clearly inhibit learning. Although some memory loss occurs with age, stress may play an even more important role than simple aging in this process. In one study older people with low stress hormone levels tested as well as younger people in cognitive tests: those with higher stress levels tested between 20% and 50% lower.

Effect of Acute Stress on Memory. Studies indicate that the immediate effect of acute stress impairs short-term memory, particularly verbal memory. In one interesting 2000 study, subjects took pills containing either cortisone (a stress hormone) or a placebo (a dummy pill). Those taking the cortisone performed significantly worse on memorization tests than those taking the placebo pill did. In an earlier study, when individuals were subjected to four days of stress, verbal memory was also impaired. Fortunately, in such cases, memory is restored after a period of relaxation.

Effect of Chronic Stress on Memory. Studies have strongly associated prolonged exposure to cortisol (the major stress hormone) to shrinkage in the hippocampus, the center of memory. For example, two studies reported that groups who suffered from post-traumatic stress disorder (Vietnam veterans and women who suffered from sexual abuse) displayed up to 8% shrinkage in the hippocampus. It is not yet known if this shrinkage is reversible.

Other Disorders

Allergies. Research suggests that stress, not indoor pollutants, may actually be a cause of the so-called sick-building syndrome, which produces allergy-like symptoms, such as eczema, headaches, asthma, and sinus problems, in office workers.

Skin Disorders. Stress plays a role in exacerbating a number of skin conditions, including hives, psoriasis, acne, rosacea, and eczema. Unexplained itching may also be caused by stress.

Unexplained Hair Loss (Alopecia Areata). Alopecia areata is hair loss that occurs in localized (or discrete) patches. The cause is unknown but stress is suspected as a player in this condition. For example, hair loss often occurs during periods of intense stress, such as mourning.

Teeth and Gums. Stress has now been implicated in increasing the risk for periodontal disease, which is disease in the gums that can cause tooth loss.

Self-Medication with Unhealthy Lifestyles

People under chronic stress frequently seek relief through drug or alcohol abuse, tobacco use, abnormal eating patterns, or passive activities, such as watching television. The damage these self-destructive habits cause under ordinary circumstances is compounded by the physiologic effects of stress itself. And the cycle is self-perpetuating; a sedentary routine, an unhealthy diet, alcohol abuse, and smoking promote heart disease, interfere with sleep patterns, and lead to increased rather than reduced tension levels. Drinking four or five cups of coffee, for example, can cause changes in blood pressure and stress hormone levels similar to those produced by chronic stress. Animal fats, simple sugars, and salt are known contributors to health problems.

WHO IS AT RISK FOR CHRONIC STRESS OR STRESS-RELATED DISEASES?

General Factors that Increase Susceptibility

At some point in their lives virtually everyone will experience stressful events or situations that overwhelm their natural coping mechanisms. In one poll, 89% of respondents indicated that they had experienced serious stress in their lives. Many factors influence susceptibility to stress.

Conditions that Influence the Effects of Stress. People respond to stress differently depending on different factors:

- Early nurturing. (Abusive behavior towards children may cause long-term abnormalities in the hypothalamus-pituitary system, which regulates stress.)
- Personality traits. Certain people have personality traits that cause them to over-respond to stressful events.

- Genetic factors. Some people have genetic factors that affect stress, such as having more or less efficient relaxation response. One 2001 study found a genetic abnormality in serotonin regulation that was associated with a heightened reactivity of the heart rates and blood pressure in response to stress. (Serotonin is a brain chemical involved with feelings of well being.)
- Immune Regulated Diseases. Certain diseases that are associated with immune abnormalities (such as rheumatoid arthritis or eczema) may actually impair a response to stress.
- The Length and Quality of Stressors. Naturally the longer the duration and more intense the stressors, the more harmful the effects.

Individuals at Higher Risk. Studies indicate that the following people are more vulnerable to the effects of stress than others:

- Younger adults. No one is immune to stress, however, and it may simply go unnoticed in the very young and old.
- Women in general. (Women, in fact, may be at higher risk than men are from stress-related chest pain, although men's hearts may be more vulnerable to adverse effects from long-term stress, such as from their jobs.)
- Working mothers. (Working mothers, regardless of whether they are married or single, face higher stress levels and possibly adverse health effects, most likely because they bear a greater and more diffuse work load than men or other women. This has been observed in women in the US and in Europe. Such stress may also have a domino and harmful effect on their children.)
- Less educated individuals.
- Divorced or widowed individuals. (A number of studies indicate that unmarried people generally do not live as long as their married contemporaries.)
- The unemployed.
- Isolated individuals.
- People who are targets of racial or sexual discrimination.

- Those without health insurance.
- People who live in cities.

Effects in Childhood

Animal studies report that rats that have been exposed to maternal grooming (ie, positive physical affection by the mother) have lower stress hormone levels in adulthood. Depressed or aggressive mothers are particularly powerful sources of stress in children, even more important than poverty or overcrowding. Children are frequent victims of stress because they are often unable to communicate their feelings accurately or their responses to events over which they have no control.

- Adolescent boys and girls experience equal amounts of stress, but the source and effects may differ.
- Girls tend to become stressed from interpersonal situations, and stress is more likely to lead to depression in girls than in boys.

For boys, one study suggested events such as changing schools or poor grades are the most important sources of stress. Another indicated, however, that the probability of childhood behavioral difficulties in a boy is increased with the number and type of stressors encountered in the home.

Stress in the Elderly

As people age, the ability to achieve a relaxation response after a stressful event becomes more difficult. Aging may simply wear out the systems in the brain that respond to stress, so that they become inefficient. The elderly, too, are very often exposed to major stressors such as medical problems, the loss of a spouse and friends, a change in a living situation, and financial worries.

Caregivers

Caregivers of Family Members. Studies show that caregivers of physically or mentally disabled family members are at risk for chronic stress. Spouses caring for a disabled partner are particularly vulnerable to a range of stress-related health threats including influenza, depression, heart disease, and even poorer survival rates. Caring for a spouse

with even minor disabilities can induce severe stress. (Intervention programs that are aimed at helping the caregiver approach the situation positively can be very helpful at reducing stress and helping the caregiver maintain a positive attitude.) Wives experience significantly greater stress from caregiving than husbands, and, according to a 2000 study, tend to feel more negative about their husbands than caregiving husbands feel about their wives.

Specific risk factors that put caregivers at higher risk for severe stress or stress-related illnesses include the following:

- Having a low income.
- Being African American. African Americans tend to be in poorer physical health than Caucasians and so face greater stress as caregivers to their spouses than their Caucasian counterparts.)
- Living alone with the patient.
- Helping a highly dependent patient.
- Having a difficult relationship with the patient.

Health Professional Caregivers. Caregiving among the health professionals is also a high risk factor for stress. One 2000 study, for example, found that registered nurses with low job control, high job demands, and low work-related social support experienced very dramatic health declines, both physically and emotionally.

Angry Personalities

People who are less emotionally stable or have high anxiety levels tend to experience specific events as more stressful than others. Some experts describe an exaggerated negative response to stress as "catastrophizing" the event (turning it into a catastrophe). An overly angry or hostile response to stressful situations may be dangerous to the heart, but studies are mixed.

- Studies in 1998 and 2000 have reported an association among women between anger, irritability, and hostility and narrowing of the arteries, a major risk factor

for heart disease. The 1998 study reported that being self conscious in public and suppressing anger were also associated with this risk.

- A 1999 study further reported a link in older women between long term anger and the development of abnormal obesity (the so-called apple shape), an important risk factor for heart diseases.
- According to a 2000 study on Army personnel, depression, anxiety, hostility, and stress did not appear to have any effect on atherosclerosis, the primary cause of coronary artery disease. And, another 2000 study suggested that, although anger itself posed no higher risk to the heart, outwardly expressed anger *plus* low social supports did appear to predict progression of heart disease. [For more information see the *Well-Connected* Report #8, *Depression*.]

Lack of Social Network

The lack of an established network of family and friends predisposes one to stress disorders and stress-related health problems, including heart disease and infections. And, a 2000 study reported that older people who maintain active relationships with their adult children are buffered against the adverse health effects of chronic stress-inducing situations, such as low income or lower social class. One study suggested this may be because people who live alone are unable to discuss negative feelings and so relieve their stress.

Work Risk Factors

According to one survey, 40% of American workers describe their jobs as very stressful. Job-related stress is particularly likely to become chronic because it is such a large part of daily life. And, stress in turn reduces a worker's effectiveness by impairing concentration, causing sleeplessness, and increasing the risk for illness, back problems, accidents, and lost time. Work stress can lead to harassment or even violence while on the job. At its most extreme, stress that places such a burden on the heart and circulation may be fatal. The Japanese even have a word for sudden death due to overwork, *karoushi*. In fact, a number of studies are now suggesting that job-related stress is as great a threat to health as smoking or not exercising.

Among the intense stressors at work are the following:

- Having no participation in decisions that affect one's responsibilities.
- Unrelenting and unreasonable demands for performance.
- Lack of effective communication and conflict-resolution methods among workers and employers.
- Lack of job security.
- Long hours.
- Excessive time spent away from home and family.
- Office politics and conflicts between workers.
- Wages not commensurate with levels of responsibility.

An Absent or Inadequate Relaxation Response

In some people, stress hormones remain elevated instead of returning to normal levels. This may occur in highly competitive athletes or people with a history of depression.

Biologic Factors

In a 1999 study scientists reported the discovery of a small protein in the brain (orphanin FQ/nociceptin) that plays an important role in the stress response. Animals with a genetic deficiency in this protein are unable to manage stress response and exhibit over-anxious behavior in response to new situations. Future research may reveal similar findings in humans.

WHAT OTHER CONDITIONS HAVE THE SAME SYMPTOMS AS STRESS?

Anxiety Disorders

The physical symptoms of anxiety disorders mirror many of those of stress, including a fast heart rate; rapid, shallow breathing; and increased muscle tension. Anxiety is an emotional disorder, however, and is characterized by feelings of apprehension, uncertainty, fear, or panic. Unlike stress, the triggers for anxiety are not necessarily or even usually associated with specific stressful or threatening conditions. Some

individuals with anxiety disorders have numerous physical complaints, such as headaches, gastrointestinal disturbances, dizziness, and chest pain. Severe cases of anxiety disorders are debilitating, and interfere with career, family, and social spheres.

Depression

Depression can be a disabling condition, and, like anxiety disorders, may result from untreated chronic stress. Depression also mimics some of the symptoms of stress, including changes in appetite, sleep patterns, and concentration. Serious depression, however, is distinguished from stress by feelings of sadness, hopelessness, loss of interest in life, and, sometimes, thoughts of suicide. Acute depression is also accompanied by significant changes in the patient's functioning. Professional therapy may be needed in order to determine if depression is caused by stress or if it is the primary problem.

Post-Traumatic Stress Disorder Symptoms

Post-traumatic stress disorder (PTSD) is a reaction to a very traumatic event: it is actually classified as an anxiety disorder. The event that precipitates PTSD is usually outside the norm of human experience, such as intense combat or sexual assault. The patient struggles to forget the traumatic event and frequently develops emotional numbness and event-related amnesia. Often, however, there is a mental flashback, and the patient re-experiences the painful circumstance in the form of intrusive dreams and disturbing thoughts and memories, which resemble or recall the trauma. Other symptoms may include lack of pleasure in formerly enjoyed activities, hopelessness, irritability, mood swings, sleep problems, inability to concentrate, and an excessive startle-response to noise.

WHAT ARE THE GENERAL GUIDELINES FOR REDUCING STRESS?

Perhaps the best general approach for treating stress can be found in the elegant passage by Reinhold Niebuhr, "Grant me the courage to change the things I can change, the serenity to accept the things I can't change, and the wisdom to know the difference." The process of learning to control stress is life-long, and will not only contribute to better health, but a greater ability to succeed in one's own agenda.

When to Seek Professional Help for Stress

Stress can be a factor in a variety of physical and emotional illnesses, which should be professionally treated. Many stress symptoms are mild and can be managed by over the counter medications (eg, aspirin, acetaminophen, or ibuprofen for tension headache and antacids and anti-diarrhea medications or laxatives for mild stomach distress). A physician should be consulted, however, for physical symptoms that are out of the ordinary, particularly those which progress in severity or awaken one at night. A mental health professional should be consulted for unmanageable acute stress or for severe anxiety or depression. Often short-term therapy can resolve stress-related emotional problems.

Considerations for Choosing a Strategy for Reducing Stress

In choosing specific strategies for treating stress, several factors should be considered.

- First, no single method is uniformly successful: a combination of approaches is generally most effective.
- Second, what works for one person does not necessarily work for someone else.
- Third, stress can be positive as well as negative. Appropriate and controllable stress provides interest and excitement and motivates the individual to greater achievement, while a lack of stress may lead to boredom and depression.
- Finally, stress may play a part in making people vulnerable to illness. A physician or psychologist should be consulted if there are any indications of accompanying medical or psychologic conditions, such as cardiac symptoms, significant pain, anxiety, or depression.

Overcoming Obstacles to Treatment

Often people succeed in relieving stress for the short-term but resort to previous ways of stressful thinking and behaving because of outside pressure or entrenched beliefs or habits.

- One major obstacle to reducing stress is the strong biologic urge for fight or flight itself. The very idea of relaxation can feel threatening, because it is perceived as letting down one's guard. For example, an over-demanding boss may put a subordinate into a psychologic state of fighting-readiness, even though there is no

safe opportunity for the subordinate to fight back, or even express anger. Stress builds up, but the worker has the illusion, even subconsciously, that the stress itself is providing safety or preparedness, so does nothing to correct the condition.

- Many people are afraid of being perceived as selfish if they engage in stress-reducing activities that benefit only themselves. The truth is that self-sacrifice may be inappropriate and even damaging if the person making the sacrifice is unhappy, angry, or physically unwell.
- Many people believe that certain emotional responses to stress, such as anger, are innate and unchangeable features of personality. Research has shown, however, that with cognitive behavioral therapy, individuals can be taught to change their emotional reactions to stressful events.

It is essential to remember that reducing stress and staying relaxed clears the mind so it can initiate appropriate actions to get rid of the stress-ridden conditions.

Stress Reduction and Effects on Health

It should be strongly noted that treating stress cannot cure medical problems. Any stress management program is not a substitute for standard medical treatments, but it can be a very important component in a medical regimen. Some studies have reported the following:

A 2001 study reported that treatments that reduce psychological distress after a heart attack appeared to improve long-term outlook. Some evidence exists that stress management programs may reduce the risk of heart events (eg, heart attack) by up to 75% in people with heart disease. One study found that stress management programs are more effective than exercise in reducing heart risks (although exercise is also protective).

A 2001 study reported that stress management techniques along with methods for coping with anger were associated with lower blood pressure.

In one 2001 study, patients with chronic daily tension headache who were given tricyclics reported greater improvement after a month than those who were taught stress management techniques. The combination of the two approaches worked even better. And at six months, stress management was as effective as the antidepressants in improving headaches.

WHAT ARE SOME SPECIFIC STRESS REDUCTION METHODS?

Healthy Lifestyle

Healthy Diet. A healthy lifestyle is an essential companion to any stress-reduction program. General health and stress resistance can be enhanced by a regular exercise, a diet rich in a variety of whole grains, vegetables, and fruits, and by avoiding excessive alcohol, caffeine, and tobacco.

Exercise. Exercise in combination with stress management techniques is extremely important for many reasons:

- Exercise is an effective distraction from stressful events.
- Employees who follow an active lifestyle need fewer sick and disability days than sedentary workers.
- And most importantly, stress itself poses significantly less danger to overall health in the physically active individual. The heart and circulation are able to work harder for longer stretches of time, and the muscles, ligaments, bones, and joints become stronger and more flexible.

Usually, a varied exercise regime is more interesting, and thus easier to stick to. Start slowly. Strenuous exercise in people who are not used to it can be very dangerous and any exercise program should be discussed with a physician. In addition, half of all people who begin a vigorous training regime drop out within a year. The key is to find activities that are exciting, challenging, and satisfying. The following are some suggestions:

- Sign up for aerobics classes at a gym.
- Brisk walking is an excellent aerobic exercise that is free and available to nearly anyone. Even *short* brisk walks can relieve bouts of stress.
- Swimming is an ideal exercise for many people including pregnant women, individuals with musculoskeletal problems, and those who suffer exercise-induced asthma.

- Yoga or Tai Chi can be very effective, combining many of the benefits of breathing, muscle relaxation, and meditation while toning and stretching the muscles. The benefits of yoga may be considerable. Numerous studies have found it beneficial for many conditions in which stress is an important factor, such as anxiety, headaches, high blood pressure, and asthma. It also elevates mood and improves concentration and ability to focus.

As in other areas of stress management, making a plan and executing it successfully develops feelings of mastery and control, which are very beneficial in and of themselves. Start small. Just 10 minutes of exercise three times a week can build a good base for novices. Gradually build up the length of these every-other-day sessions to 30 minutes or more. [See also *Well-Connected* Report #29, *Exercise*.]

Cognitive-Behavioral Techniques

Cognitive-behavioral methods are the most effective ways to reduce stress. They include identifying sources of stress, restructuring priorities, changing one's response to stress, and finding methods for managing and reducing stress. This approach may be particularly helpful when the source of stress is chronic pain or other chronic diseases.

Identifying Sources of Stress. It is useful to start the process of stress reduction with a diary that keeps an informal inventory of daily events and activities. While this exercise might itself seem stress producing (and yet one more chore), it need not be done in painstaking detail. A few words accompanying a time and date will usually be enough to serve as reminders of significant events or activities.

- The first step is to note activities that put a strain on energy and time, trigger anger or anxiety, or precipitate a negative physical response (eg, a sour stomach or headache).
- Also note positive experiences, such as those that are mentally or physically refreshing or produce a sense of accomplishment.
- After a week or two, try to identify two or three events or activities that have been significantly upsetting or overwhelming.

Questioning the Sources of Stress. Individuals should then ask themselves the following questions:

- Do these stressful activities meet their own goals or someone else's?
- Have they taken on tasks that they can reasonably accomplish?
- Which tasks are in their control and which ones aren't?

Restructuring Priorities: Adding Stress Reducing Activities. The next step is to attempt to shift the balance from stress-producing to stress-reducing activities. Eliminating stress is rarely practical or feasible, but there are many ways to reduce its impact. One study indicated, in fact, that adding daily pleasant events has more positive effects on the immune system than reducing stressful or negative ones. In most cases, small daily decisions for improvement accumulate and reconstruct a stressed existence into a pleasant and productive one.

Consider as many relief options as possible. Examples include the following:

- Take long weekends or, ideally, vacations.
- If the source of stress is in the home, plan times away, even if it is only an hour or two a week.
- Replace unnecessary time-consuming chores with pleasurable or interesting activities.
- Make time for recreation. (This is as essential as paying bills or shopping for groceries.)

Discuss Feelings. The concept of communication and "letting your feelings out" has been so excessively promoted and parodied that it has nearly lost its value as good psychologic advice. Nevertheless, feelings of anger or frustration that are not expressed in an acceptable way may lead to hostility, a sense of helplessness, and depression.

Expressing feelings does not mean venting frustration on waiters and subordinates, boring friends with emotional minutia, or wallowing in self-pity. In fact, because blood pressure may spike when certain chronically hostile individuals become angry, some therapists strongly advise that just talking, not simply venting anger, is the best approach, especially for these people.

The primary goal is to explain and assert one's needs to a trusted individual in as positive a way as possible. Direct communication may not even be necessary. Writing in a journal, writing a poem, or composing a letter that is never mailed may be sufficient.

Expressing one's feelings solves only half of the communication puzzle. Learning to listen, empathize, and respond to others with understanding is just as important for maintaining the strong relationships necessary for emotional fulfillment and reduced stress.

Keep Perspective and Look for the Positive. Reversing negative ideas and learning to focus on positive outcomes helps reduce tension and achieve goals. The following steps using an example of a person who is alarmed at the prospect of giving a speech may be useful:

- First, identify the worst possible outcomes (forgetting the speech, stumbling over words, humiliation, audience contempt).
- Rate the likelihood of these bad outcomes happening (probably very low or that speaker wouldn't have been selected in the first place).
- Envision a favorable result (a well-rounded, articulate presentation with rewarding applause).
- Develop a specific plan to achieve the positive outcome (preparing in front of a mirror, using a video camera or tape recorder, relaxation exercises).
- Try to recall previous situations that initially seemed negative but ended well.

Use Humor. Research has shown that humor is a very effective mechanism for coping with acute stress. Keeping a sense of humor during difficult situations is a common recommendation from stress management experts. Laughter not only releases the tension of pent-up feelings and helps keep perspective, but it appears to have actual physical effects that reduce stress hormone levels. It is not uncommon for people to recall laughing intensely even during tragic events, such as the death of a loved one, and to remember this laughter as helping them to endure the emotional pain.

Reducing Stress on the Job

Many institutions within the current culture, while paying lip service to stress reduction, put intense pressure on individuals to behave in ways that promote tension. Some experts argue that employers should be held responsible for taking measures to prevent stress from work overload and should provide help to deal with work-related stress. Treating stress has a number of benefits, not only for the individual but also for the employer. In one study, for example, in which a company set up a two-year stress management educational program, the savings to the company in workmen's compensations costs were nearly \$150,000, compared to the cost of the program which was only \$150 per participant for a total of \$6,000. A study in Japan indicated that the most popular approaches for reducing stress in the work place were educational and consultation programs for each individual worker. Stress prevention methods that only involved management were inadequate.

In general, however, few workplaces offer stress management programs, and it is usually up to the employee to find their own ways to reduce stress. Here are some suggestions:

- Seek out someone in the Human Resources department or a sympathetic manager and communicate concerns about job stress. Work with them in a non-confrontational way to improve working conditions, letting them know that productivity can be improved if some of the pressure is off.
- Establish or reinforce a network of friends at work and at home.
- Restructure priorities and eliminate unnecessary tasks.
- Learn to focus on positive outcomes.
- If the job is unendurable, plan and execute a career change. Send out resumes or work on transfers within the company.
- If this isn't possible, be sure to schedule daily pleasant activities and physical exercise during free time.

It may be helpful to keep in mind that the bosses are also victimized by the same stressful conditions they are imposing.

Strengthen or Establish a Support Network

Studies of people who remain happy and healthy despite many life stresses conclude that most have very good networks of social support. One study indicated that support even from strangers reduced blood pressure surges in people undergoing a stressful event. Many studies suggest that having a pet helps reduce medical problems aggravated by stress, including heart disease and high blood pressure.

Relaxation Techniques

Since stress is here to stay, everyone needs to develop methods for invoking the relaxation response, the natural unwinding of the stress response. Relaxation lowers blood pressure, respiration, and pulse rates, releases muscle tension, and eases emotional strains. This response is highly individualized, but there are certain approaches that seem to work. Combinations are probably best. For example, in a study of children and adolescents with adjustment disorder and depression, a combination of yoga, a brief massage, and progressive muscle relaxation effectively reduced both feelings of anxiety and stress hormone levels. No one should expect a total resolution of stress from these approaches, but if done regularly, these programs can be very effective. [See Table.]

Relaxation Methods	Specific Procedure
<p><i>Deep Breathing Exercises.</i> During stress, breathing becomes shallow and rapid. Taking a deep breath is an automatic and effective technique for winding down. Deep breathing exercises consciously intensify this natural physiologic reaction and can be very useful during a stressful situation, or for maintaining a relaxed state during the day.</p>	<ul style="list-style-type: none"> • Inhale through the nose slowly and deeply to the count of ten. • Make sure that the stomach and abdomen expand but the chest does not raise up. • Exhale through the nose, slowly and completely, also to the count of ten. • To help quiet the mind, concentrate fully on breathing and counting through each cycle. • Repeat five to ten times and make a habit of doing the exercise several times each day, even when

	not feeling stressed.
<p>Muscle Relaxation. Muscle relaxation techniques, often combined with deep breathing, are simple to learn and very useful for getting to sleep. In the beginning it is useful to have a friend or partner check for tension by lifting an arm and dropping it; the arm should fall freely. Practice makes the exercise much more effective and produces relaxation much more rapidly.</p>	<ul style="list-style-type: none"> • • After lying down in a comfortable position without crossing the limbs, concentrate on each part of the body. • Maintain a slow, deep breathing pattern throughout this exercise. • Tense each muscle as tightly as possible for a count of five to ten and then release it completely. • Experience the muscle as totally relaxed and lead-heavy. • Begin with the top of the head and progress downward to focus on all the muscles in the body. • Be sure to include the forehead, ears, eyes, mouth, neck, shoulders, arms and hands, fingers, chest, belly, thighs, calves, and feet. • Once the external review is complete, imagine tensing and releasing internal muscles.
<p>Meditation. Meditation, used for many years in Eastern cultures, is now widely accepted in this country as a relaxation technique. The goal of all</p>	<p>Mindfulness Meditation. Mindfulness is a common practice that focuses on breathing. It employs the basic technique used in other forms of meditation.</p> <ul style="list-style-type: none"> • Sit upright with the spine straight,

meditative procedures, both religious and therapeutic, is to quiet the mind (essentially, to relax thought). With practice, meditation reduces stress hormone levels and elevates mood. The practiced meditator can achieve a reduction in heart rate, blood pressure, adrenaline levels, and skin temperature while meditating.

Some recommend meditating for no longer than 20 minutes in the morning after awakening and then again in early evening before dinner. Even once a day is helpful. (One should probably not meditate before going to bed: some people who meditate before sleep wake up in the middle of the night alert and unable to return to sleep.)

New practitioners should understand that it can be difficult to quiet the mind, and should not be discouraged by lack of immediate results.

A number of techniques are

either cross-legged or sitting on a firm chair with both feet on the floor, uncrossed.

- With the eyes closed or gently looking a few feet ahead, observe the exhalation of the breath.
- As the mind wanders, one simply notes it as a fact and returns to the "out" breath. It may be helpful to imagine one's thoughts as clouds dissipating away.

Transcendental Meditation (TM). TM uses a mantra (a word that has a specific chanting sound but no meaning). The meditator repeats the word silently letting thoughts come and go. In one study, TM was as effective as exercise in elevating mood.

Mini-Meditation. The method involves heightening awareness of the immediate surrounding environment. Choose a routine activity when alone. For example:

- While washing dishes concentrate on the feel of the water and dishes.
- Allow the mind to wander to any immediate sensory experience (sounds outside the window, smells from the stove, colors in the room).
- If the mind begins to think about

<p>available. A few are discussed here.</p>	<p>the past or future, abstractions or worries, redirect it gently back.</p> <ul style="list-style-type: none"> • This redirection of brain activity from your thoughts and worries to your senses disrupts the stress response and prompts relaxation. It also helps promote an emotional and sensual appreciation of simple pleasures already present in a person's life.
<p><i>Biofeedback</i></p>	<ul style="list-style-type: none"> • During biofeedback, electric leads are taped to a subject's head. • The person is encouraged to relax using methods such as those described above. • Brain waves are measured and an audible signal is emitted when alpha waves are detected, a frequency which coincides with a state of deep relaxation. • By repeating the process, subjects associate the sound with the relaxed state and learn to achieve relaxation by themselves.
<p><i>Massage Therapy.</i> Massage therapy appears to slow down the heart and relax the body. Rather than causing drowsiness, however, massage actually increases alertness. A number of</p>	<p><i>Swedish massage</i> uses muscle manipulation. It is the standard massage technique and is widely available.</p> <p><i>Shiatsu</i> applies intense pressure to parts of the body. It can be painful, but people report deep relaxation afterward.</p>

massage therapies are available and some are listed here.

Reflexology manipulates acupuncture points in the hands and feet.

WHERE ELSE CAN INFORMATION ABOUT STRESS BE OBTAINED?

National Institute of Mental Health, 6001 Executive Boulevard, Rm. 8184, MSC 9663
Bethesda, MD 20892-9663 USA

Call (301-443-4513) or (<http://www.nimh.nih.gov/>).

National Alliance for the Mentally Ill, Colonial Place Three 2107 Wilson Blvd., Suite 300 ,Arlington, VA 22201-3042 Call 1-800-950-NAMI (6264), Front Desk-(703)524-7600, Facsimile-(703)524-9094 or (<http://www.nami.org/>).

NAMI is a national grass roots organization providing ways for self-help and support organizations to individuals and families of people with psychologic disorders.

National Mental Health Association, 1021 Prince St., Alexandria, VA 22314-2971. Call (703-684-7722), Fax (703-684-5968) or (<http://www.nmha.org/>).

This organizations will give the names and numbers of regional chapters and also provides information on 200 mental health topics.

American Institute for Cognitive Therapy 136 East 57th Street, Suite 1101, New York City, New York 10022 call (212-308-2440) or (<http://www.cognitivetherapynyc.com/>)

Association for the Advancement of Behavior Therapy
305 Seventh Avenue - 16th Floor, New York, NY 10001-6008
call (212-647-1890) or (800-685-AABT) or (<http://www.aabt.org/>)

The American Psychiatric Association
1400 K Street N.W., Washington, DC 20005

Call (888) 357-7924, Fax 202-682-6850 or (<http://www.psych.org>)

The American Psychological Society, 1010 Vermont Avenue, NW, Suite 1100
Washington, DC 20005-4907 Call (202)783-2077 or
(<http://www.psychologicalscience.org/>)

The American Psychological Association, 750 First Street NE, Suite 700 Washington,
DC 20002-4242 (<http://www.dotcomsense.com>) for consumers and
(<http://helping.apa.org/find.html>) for finding a psychologist.

The National Association of Social Workers, 750 First Street NE, Suite 700, Washington,
DC 20002-4241. Call (202-408-8600) or (<http://www.naswdc.org>)

The American Psychiatric Nurses Association
Colonial Place Three, 2107 Wilson Blvd., Suite 300-A, Arlington, VA 22201. Call (703)
243-2443 or (<http://www.apna.org>)

American Academy of Child and Adolescent Psychiatry
3615 Wisconsin Ave., N.W., Washington, D.C. 20016-3007. call (202-966-7300), fax:
(202-966-2891) or (<http://www.aacap.org/>)

Mental Health Net
CMHC Systems 570 Metro Place North Dublin, OH 43017 Call (614.764.0143),
(800.528.9025) or (<http://www.cmhc.com/>)

Internet Mental Health (<http://www.mentalhealth.com/>) is a free encyclopedia of mental
health information.

MEDITATION SITES

Transcendental Meditation

888-LEARN TM (532-7686) or (<http://www.tm.org/>)

Mindfulness Meditation

Centers teaching both Shambhala (secular) meditation and buddhist traditions across the
US are listed (<http://www.shambhala.org>)

Meditation Instruction

Simple instruction and information about a variety of meditation techniques (<http://www.meditationcenter.com>)

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