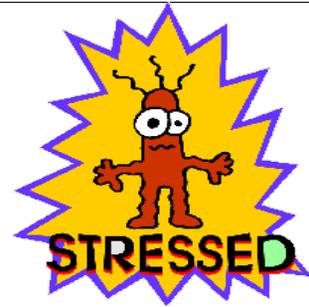


Stress

By Tamara Mitchell



It is generally agreed by the scientific community that stress is not what happens to someone. Stress is how a person responds to stressors.¹ Stress is the physical and emotional wear and tear resulting from real or imagined problems.²

History

The originator of the theory of stress is Hans Selye, a researcher in endocrinology. He was 28 years old in 1934, doing research on rats injected with ovarian extract, and searching for a new hormone at McGill University. The injection resulted in the development of three symptoms: enlargement of the adrenal cortex, atrophy of the thymus, spleen, and lymph nodes, and deep bleeding ulcers in the lining of the stomach and duodenum.³ These symptoms could be increased or decreased in severity by increasing or decreasing the amount of extract. But then Selye tried the same experiment using placental extract, pituitary extract, kidney, spleen, and various other organ extracts, and finally, the toxic chemical Formalin³ These all produced the same symptoms!³ Clearly, the physical problems



Photo courtesy Ref. 5

were not the result of the ovarian extract. It occurred to Selye that these physical problems closely resembled the symptoms of his first human patients when he was in medical school at the age of 19. Regardless of the actual ailment, they all had general symptoms that had one thing in common. The early human patients were all coping with illness and were having a nonspecific reaction of the body to damage of any kind. The rats in his experiments were being damaged and fearful of the injection of foreign substances.³ Doctors usually prescribed calming activities such as rest, eating easily digestible foods, and protection from wide temperature variations for their human patients and these measures usually aided recovery from almost any ailment even though they didn't understand why these things helped.³

Selye was busy with medical school, mentioned this idea to his advisor who chuckled at the naiveté of this notion, so he set his hypothesis aside and after several days of brooding and depression, he accepted the failure of his experiments. It wasn't until the summer of 1936 that Selye revisited his concept, wrote a short Letter to the Editor in the British Journal of Nature proposing a syndrome termed the General Adaptation

Syndrome (G.A.S.) or stress syndrome, and decided to devote his life to it.^{3,4} In his words, “Every stress leaves an indelible scar, and the organism pays for its survival after a stressful situation by becoming a little older.”⁴ He defined three phases of coping and the nonspecific response of the body to any demand over a period of time.^{3,6}

1. Alarm reaction where the body prepares for fight or flight.
2. Adaptation to the demand where resistance is built up.
3. Exhaustion develops if the demand continues and results in fatigue, wear, and tear.

The link between emotions and physical arousal was previously identified in 1915 by a Harvard Medical School physiologist, Walter Cannon, as the “fight or flight response”.^{2,8} Cannon theorized that mammals have a physical ability to react to stress that evolved as a survival mechanism. When faced with stressful situations, we feel fear and our bodies release hormones - epinephrine (adrenaline) and norepinephrine (noradrenaline) - that elevate the heart rate and increase blood flow to the muscles, gearing our bodies either to do battle with an opponent or to flee.^{8,9}



Image courtesy Ref. 7

Today our knowledge of the stress response has been refined further and continues to be studied through research, but the basis of our understanding still confirms the theories of these two “fathers of stress”.

Stressors can be positive -- exciting things like graduating, getting married, or going on vacation -- or stressors can be negative things, like worrying about the bills, breaking a leg, or dealing with traffic on your daily commute.² These stressors can be sudden, one-time occurrences or repeated or continuous.¹ Stress can be a result of either physical or psychological factors.¹ We often get stressed by worrying or imagining disasters that do not and may never occur.² The body’s response to stress is comprehensive and complex, and it affects the operation of many systems.¹

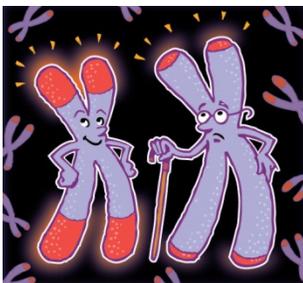
When Repetitive Stress Injury is discussed and/or diagnosed, typically only the physical effects of repeated abuses exerted on the body from the outside are considered. Unfortunately this is not the whole problem. The tension from emotional stress and the hormones involved in the stress response have an effect on the body that predisposes it to injury and damage.

The physical effects of stress

As noted above, the body has a similar set of responses to a broad array of stressors.² These responses include:^{2,10}

1. Rapid mobilization of energy from storage. Glucose, simple proteins and fats pour out of fat cells, liver, and muscles. For most people, unused glucose is reabsorbed by the body and is not a problem, but for diabetics, this surge of glucose can spell trouble. Even for people without diabetes, this release and reabsorption process requires energy and repeated stress may result in fatigue.

2. Increased muscle tension and musculoskeletal disorders. Stress causes muscles to tense up all at once and chronic stress causes muscles in the body to be tense for long periods of time in a constant state of guardedness. Tension-type headaches and migraines are associated with chronic muscle tension in the shoulders, neck, and head. Other musculoskeletal disorders can result due to chronic or repeated muscle tension.
3. Increased heart rate and blood pressure to speed up the transport of nutrients and oxygen. For people with cardiovascular disease or a predisposition to cardiovascular disease, these stresses can increase existing problems or prove fatal. Repeated stress to the cardiovascular system causes wear and tear on the blood vessels and heart. Fatty acids and glucose released into the blood during stress cause buildup of deposits and hardening of the blood vessel walls called atherosclerosis.
4. Increased breathing to increase oxygen levels. For people with asthma or lung disease this can bring on episodes or prove fatal in extreme cases. In addition, hyperventilation can bring on a panic attack.
5. Decreased sex drive. Females are less likely to ovulate or to carry pregnancies to term; males secrete less testosterone and have trouble with erections. And there are compounding factors that add to the natural decrease in sex drive that comes with stress: poor eating habits, decreased sleep, excessive use of alcohol and tobacco, and decreased physical exercise all contribute to decreased sex drive.¹¹
6. Changes in appetite and digestion. Hunger and types of food consumed may increase or decrease, heartburn and acid reflux may occur, consumption of alcohol or tobacco may increase, the stomach may react with butterflies, nausea, pain, or ulcers, and either diarrhea or constipation may occur. Although the connection is not direct, stress also is a major factor in ulcers and irritable bowel syndrome (IBS).^{2,12}
7. Inhibited immunity to save the body's energy for the crisis at hand.
8. Diminished perception of pain.
9. Improved memory and recall in the short term. Impairs the ability to reason, think flexibly, solve problems, or apply knowledge in different situations.¹³ Prolonged stress causes long-term elevated levels of cortisol that leads to deterioration of the part of the brain responsible for short-term memory.¹⁴
10. Chronic stress is being studied in its role in accelerated biologic aging and associated adverse effects on immune system function.¹⁵ Stress significantly reduces the immune response. Many factors in the lives of seniors are sources of fairly severe stress and depression typically from caring for a spouse, chronic illnesses, loss of important people in life, loss of independence and financial insecurity, and cognitive impairment.^{15, Lavertsky} While cortisol levels rise with prolonged stress, eventually chronic stress reduces cortisol to a *hypocortisolemic* state and that is associated with a



shortening of telomeres.¹⁶ Telomeres are “caps” at the ends of chromosomes that preserve their integrity.^{15,17} The length of the telomere progressively shortens with each cell division and determines the cellular life span.^{15,17} Stress accelerates the shortening of telomeres and eventually causes aging and organ deterioration because the cells can no longer replicate and maintain a healthy status.¹⁷ It is too soon to tell exactly what effect stress and related depression

and inflammation has on some diseases such as cancer, but it does appear to accelerate aging.¹⁶

All of the stress responses are meant to be short-term in order to mobilize the body for action. They are short-sighted and inefficient, but they are important in a physical crisis situation.² They evolved over the millennium when threats tended to be predators chasing us to eat us. To a great extent, these physiological responses are completely useless in the context of giving a speech, hearing disturbing news on TV, or handling spiraling health care costs. The types of stressors we commonly experience today are quite different from our ancient ancestors and we have not had enough time to evolve biologically to cope in new ways. Today's stressors are often not short-term, though they still may be...like encountering a snake or snarling dog. Our stressors tend to be long-term or chronic, or they may be a bombardment of stresses throughout the day on an ongoing basis.

The stress response is also called into play when there is no actual threat, as in the case of phobias or even worries.⁹ The risk of disease has increased as a result.² It is up to us to understand what is happening in our bodies when we experience stress and to learn to deal with it in a way that causes as little damage as possible.

Hormones of the Stress Response

The autonomic nervous system controls bodily functions which we are largely unaware of and do not consciously control. The part of the autonomic nervous system that is activated during emergencies is the *sympathetic nervous system*, which speeds up systems needed for survival.² The other part of the autonomic nervous system, the *parasympathetic nervous system*, plays an opposing role. It mediates passive activities and promotes growth and energy storage. Parts of this system are also called into play during stress to slow down systems not required for survival.²

When something stressful happens or you think a stressful thought, many hormones are released by the brain, nervous system, and other organs. Hormones are the messengers of the body which activate various bodily systems. The organs and hormones involved in short-term stress are somewhat different from long-term stress. The pattern of the body's response to stress is not consistent. Big physical stressors result in hormonal changes, with the glucocorticoid and epinephrine/norepinephrine response being the common.² More subtle stressors result in a variety of responses. For example, anxiety and vigilance types of stress may result in the release of epinephrine and norepinephrine, while depression and giving-up types of stress may result in the release of glucocorticoids.²

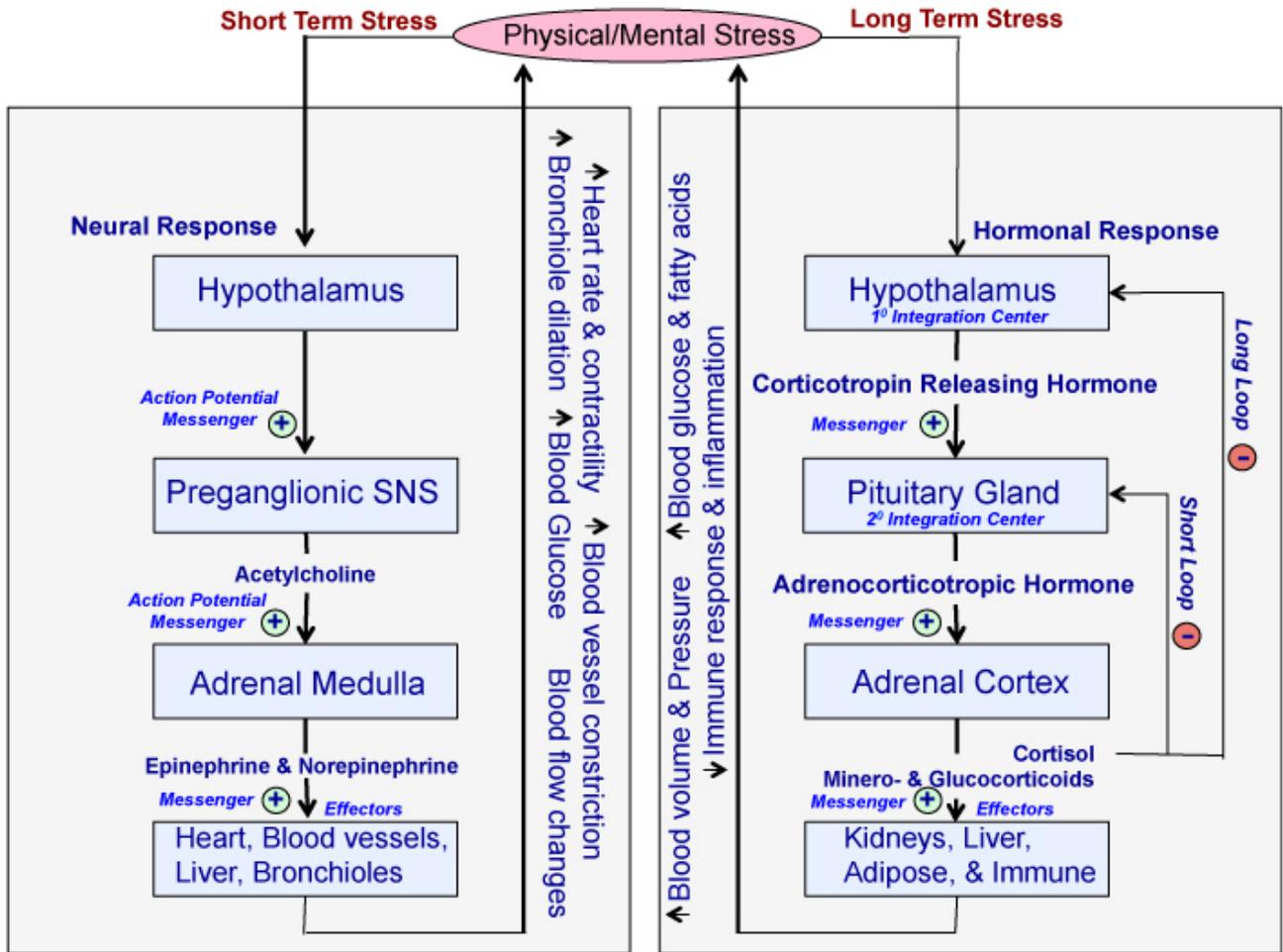


Illustration courtesy of Reference 18

Epinephrine and glucocorticoids appear to act in similar ways, however epinephrine acts within seconds, while glucocorticoids are slower-acting, backing up the epinephrine for minutes or hours.² Together, epinephrine, norepinephrine, and the glucocorticoids account for a large portion of what happens in the body during stress.²

The psychological sources of stress

Acute stresses, like acute injuries, are sudden immediate threats which are either real or interpreted to be a danger.² Sources of these problems may include:

- Pressures of everyday life
- Conflicts including choices and arguments
- Frustrations
- Noise
- Crowding
- Isolation
- Hunger
- Danger
- Infection

- High technology (such as video games, constant interruptions from mobile devices, malfunctions, or changes in operating systems)
- Imagining a threat or remembering a dangerous event

Chronic stresses, like chronic injury or illness, are long-term situations which become a constant source of anxiety.¹⁹ Sources of chronic stress may include:^{2,21, 22}

- Ongoing work pressure
- Long-term relationship problems
- Loneliness
- Persistent financial worries
- Long-term caregiving responsibilities
- Anxiety disorders

Psychological responses to stress

There are several common responses to stress, though this is not an exhaustive list:

- Eating
- Effects on memory, concentration, and learning
- Substance abuse and unhealthy habits
- Displaced aggression
- Anxiety disorders
- Depression

Eating. Cravings for salt, fat, and sugar are linked to the release of glucocorticoids.^{2,23,19} When glucocorticoids and insulin are in our system, fat tends to be deposited around the abdomen of humans probably as a survival mechanism to store away fat when food may not be available.²³ Long-term stress is often linked to eating unhealthy foods as a source of energy and our body stores a lot of it away leading to weight gain. In addition, eating this type of food is also considered “comfort food” which cause the release of endorphins and that, in turn, reduce feelings of stress.¹⁹ Research has found that overeating may be triggered in women who are dealing with financial, work, and family problems while men gain more weight from lack of decision authority at work and difficulty learning new job skills.¹⁹ Research is mixed as to whether stress leads to actual eating disorders, but it does lead to overeating and weight gain.¹⁹

Memory, concentration, and learning. While acute stress tends to enhance memory storage and improve concentration, chronic stress causes loss of concentration, inefficiency, and tendency toward accidents.¹⁹ Long-term stress and exposure to the body’s hormone cortisol result in a shrinking of the hippocampus, the brain’s memory center.¹⁹

Substance abuse and unhealthy habits. Alcohol affects the receptors in the brain that reduces stress. Lack of nicotine increases stress in smokers. In addition to often adopting unhealthy eating habits, people under chronic stress may drink too much, smoke too much, and adopt a sedentary lifestyle with too little activity.¹⁹

Many smokers claim that cigarettes help to calm them when they feel stressed; however, medical and scientific evidence indicates that nicotine dependency is a cause of psychological stress.²⁴ Stress levels are higher than those of nonsmokers during periods of abstinence, and only when smoking is resumed do smokers' moods and stress levels return to normal.²⁴ Therefore, smoking seems to be only capable of normalizing the negative emotions and feelings that build up with nicotine dependence.²⁴ After the initial period of withdrawal when symptoms have passed, quitting leads to a significant reduction in self-reported stress.²⁴

Displaced Aggression. If we are unable to confront the source of stress, if we don't see any way to control our circumstances, and if we don't have help or support, some people deal with things by attacking someone or something weaker than themselves.²³ Picking a fight with the spouse, abusing the children, kicking the dog, or racist behavior are all ways that stress can lead to the unfortunate behaviors of displaced aggression.²³

Anxiety Disorders. There are several types of anxiety disorders that involve more than a temporary worry or fear. It goes beyond feeling nervous about a specific event or decision to be made. This type of anxiety doesn't go away over time and it tends to get worse.²⁵

Overcoming any type of Anxiety Disorder requires that the person visit their health practitioner to rule out physiological health issues, but also usually involves mental health evaluation treatment and therapies. Various types of psychotherapy, stress-management techniques, and medications are available to help manage anxiety. Talking to trusted friends or clergy may help, but that is rarely sufficient to resolve chronic issues.²⁵ It is important to confront anxiety disorders because they are debilitating, physically taxing, and are often associated with other related conditions such as depression or obsessive-compulsive disorder.²⁵

- Generalized Anxiety Disorder involves excessive anxiety or worry for months. The symptoms include restlessness, fatigue, difficulty concentrating, irritability, muscle tension, lack of control over worry, and sleep difficulty.^{25,22}
- Panic Disorder involves sudden, intense episodes of intense fear that may include a pounding heart, sweating, trembling or shaking, shortness of breath, a feeling of smothering or choking, and a feeling of impending doom. People who experience such panic attacks become afraid of circumstances or places where attacks have previously occurred and they feel out of control during the attack.^{25, 22}
- Social Anxiety Disorder includes intense anxiety about certain social situations, feelings of being very self-conscious, fear of judgement, rejection, or embarrassment, fear of offending others, worrying for long periods of time about upcoming social events or appointments, avoiding friendships or places where there are other people.^{25, 22}
- Separation Anxiety involves excessive anxiety about being separated from a significant person, fear of being alone, nightmares about separation, and physical symptoms of anxiety when separation occurs or is anticipated.²²

- Phobias involve excessive anxiety relating to objects or situations that are completely out of proportion to the real situation such as spiders, heights, needles, enclosed places, loud sounds, or clowns.²² Fear and avoidance last at least six months and the anxiety impacts the person's ability to function normally in real life.²²
- Post-Traumatic Stress Disorder (PTSD) involves exposure to a deeply distressing experience in life such as exposure to death, serious injury, or sexual violence.²² There are a wide variety of emotional and behavioral symptoms that may be associated with PTSD including memories, dreams, flashbacks, changes in mood or thinking, variations in reactivity, irritability, recklessness, hypervigilance, sleeping problems, etc.²² Physical and emotional reactions last over one month, cause significant distress, and impact the ability to function normally.²²

Depression

People experiencing a lot of life stress are more likely to sink into major depression.² 5-20% of the population succumbs to major depression at some point in life while facing daily ups and downs.² A genetic predisposition to depression creates a 50% chance of developing it.² Environmental factors, such as stress, are responsible for the remaining 50%.²

Increased glucocorticoids in the bloodstream increase the risk of depression. People suffering from depression, anxiety, panic disorder, malnutrition, and alcohol abuse often have elevated glucocorticoid levels.^{26,27} The outside appearance of a depressed person is one of immobility and perhaps lethargy, but internally, the person is boiling with emotional turmoil and stress.² Research is ongoing, but it appears that the glucocorticoid receptor in the brain may be altered causing an impaired feedback mechanism.^{26,27} Antidepressants may function by modulating the glucocorticoid receptor.^{26,27}

Moderators of the Stress Response

Many factors affect the intensity and nature of stress experienced. Although the stress response is physiologically similar, the intensity of the response and how we cope with the stress, and even whether we perceive an event or thought to be stressful varies widely. A perception that things are getting worse increases stress which increases the level of glucocorticoids in the blood that causes physical damage over the long term.² In contrast, people deal better with stress when they have outlets such as exercise or hobbies, or even imagining outlets like sitting on a tropical beach.²

Some of the factors that modify our response to typical stressors are:

- Social support
- Affectionate touch
- Predictability
- Personality, temperament, and stress consequences
- Life and work factors
- Poverty

Social support

Social support can be very protective for humans, but not all types of social interaction are stress-reducing for all people.² Both long-term and short-term instances of stress can be reduced through social support.^{2,29} Support systems for people in high-stress jobs, such as nurses, have been shown to improve optimism and psychological well-being.³⁰

Close relationships with family, friends, and intimate partners are fundamental to *thriving* in both of these respects because:

- 1) They provide buffering from the negative effects of stress and with the support and assistance of significant others, the person is empowered in efforts to rebuild and strengthen their abilities following the stressful event. They also provide a safe haven by providing emotional comfort and facilitating problem resolution. This is called Source Of Support and it has most recently been expanded beyond the simple role of helping to cope with stress, to include the more broad scope of actually *thriving in the face of adversity*.³¹
- 2) They provide support of exploration behavior and provide a secure base from where an individual can grow by being nurtured, having their goals, dreams, and aspirations encouraged and helping to create a vision of future possibilities.³¹

In past generations, people were surrounded by family and a social network that provided an automatic source of close and intimate friendships and relationships.³⁴ Today, our lives tend to be much more isolated with couples providing most of the support, comfort, safety, and sense of home to each other that entire communities used to provide.³⁴ If a partner fails to meet expectations, the relationship becomes filled with disappointments of all types often with few skills to communicate this or work it out and the relationship becomes a source of chronic stress. Additionally, today partners are equals in the relationship whereas in past eras, one party was often subservient and/or dependent. While equality is good, it adds complications when one party is seen as not pulling their weight in the relationship.³⁴ It's a lot to ask that couples provide all the emotional needs that used to be provided by a community.

A feeling of isolation, not being connected with other people and/or something larger, and not being known honestly and deeply by anyone leads to “emotional and spiritual heart disease” with greater risk of mortality and health problems.^{32,33} One can be surrounded by people and engaged in many social activities and still feel isolated.³² Several studies have shown that people who feel isolated have three to five times higher mortality than people who do not feel isolated.³² Many people don't seem to know where to start to make friends and if they don't have a domestic partner or romantic interest, spare hours are often spent in solitary activities. It does take some effort, courage, and time to pursue social relationships and cultivate close friendships.^{35, 36} A large number of acquaintances will never become close friends for a variety of reasons. The website SucceedSocially.com is a wealth of information to help people figure out ways to meet people and gradually develop meaningful social relationships.

Caring for and protecting children, pets, and other loved ones is a powerful stress reducer and can be a form of social connection. For most pet owners, animals fill their lives with companionship and affection, and studies show that the presence of a pet reduces the stress response, relieves depression, reduces blood pressure and triglycerides, and improves exercise habits, all of which lower the risk of heart disease.³⁸ Studies also show that animals raise self-esteem, significantly lower anxiety levels, improve attitude toward others, and open lines of communication. If a pet doesn't fit into your lifestyle, volunteering at a local animal shelter or helping neighbors with pet-sitting can provide the benefits of interaction with animals without the responsibilities.³⁸

Affectionate touch

Affectionate touch and hugging has been found to reduce stress as well as susceptibility to infection, and to lower blood pressure.^{33,39} Some of the feelings associated with affectionate touch are:

- Inclusion in a social group
- Security
- Care and acceptance
- Continuing love, commitment, and responsiveness
- Support and assistance
- Sharing, connectedness, self-other overlap

The feeling of connection buffers stress and threat.³³ For some reasons, however, touch may not be appreciated. The motive of touch may be questionable (aggressive, manipulative, or sexual), the person doing the touching may not be genuine or may be controlling, or the touch may not be welcome for other reasons, so it may be resisted or it may it may cause greater anxiety.^{33,40}

Interestingly, the actual sensation of touch can have great benefits even when it is not offered by a close friend or partner.³³ Massage therapy, a nurse's touch, or even holding something like a pillow or teddy bear appears to trigger a neurobiological pathway that buffers stress.³³

Predictability

Unpredictability makes stressors much more stressful.² Predictability exists when a person knows when and under what circumstances something will occur, but it also refers to what the event will be like and what effects it will have.⁴¹ Vague, predictive information can actually increase stress by having too little information.² Information either just before or long before the stressor does little to alleviate psychological anticipation.²

Predictability can be helpful in certain circumstances by allowing us to use different mental strategies to cope with the oncoming stressor.² People and other organisms habituate to repeated stressors, so that something that is stressful at first becomes less stressful as it occurs over and over again, resulting in a much smaller stress response.^{2,23}

Control, locus of control, and learned helplessness

Belief that you have control generally reduces the response to stressors.² It is not necessary to exercise that control, but it is important to know it is available and that there is something we can do about it.^{2,23} For instance, air travel is safer than driving, however people are afraid of flying much more than driving.² This is because most people believe they are above average drivers and have more control over the situation.²

Ability to learn information or to perform simple tasks is impaired if people are stressed and in a situation where they cannot control the stressor. Subsequent coping abilities are impaired as well. In some people, it is so severe that they will not attempt even the simplest task to improve their life situation.² This is called “*learned helplessness*” and it can be induced very easily. It is especially easy to invoke in people who generally believe that the world operates due to chance or luck (i.e., an external locus of control).² It is less easy to invoke in people who believe they are largely masters of their own fate (i.e., an internal locus of control).² Learned helplessness affects people’s perception of the world, so even if they do make an attempt at a coping response, they can’t tell if it made any difference. Their perception shifts from the fact that they cannot control the *current* situation to the belief that they will never have any effect on future situations.² Certain circumstances seem to lead to this type of thinking. For example, if a teacher or loved one exposes a child to uncontrollable stressors at a critical time in the child’s development, the child may grow up with distorted beliefs about what they cannot learn or are incapable of doing.²

There are a variety of tools and techniques that people can use to control your own stress even if you have no control over the situation. We will discuss this later.

Personality and temperament

Personality and temperament are very important in understanding why some people are more prone to stress-related diseases.²

Someone with a Type A personality is competitive, overachieving, time-pressured, impatient, and occasionally hostile. Type A personalities are those who usually get worked up and angry at things that the rest of the world does not find very provocative.²

Initially, it was thought that a Type A personality was linked to higher risk of stress-related diseases. Later it was found that hostility was the only significant predictor. This was consistent across very different populations, many studies, and even when variables such as age, weight, blood pressure, cholesterol levels, and smoking were controlled.² Openly hostile and angry people have a high rate of cardiovascular disease, but those who try not to express hostility have an even higher rate.² Repressing the expression of strong emotions appears to exaggerate the intensity of the physiological response that accompanies them.²

An alternative view still maintains that at the core of hostility is the “time-pressuredness” of all Type A personalities since they tend to be less able to savor the moment, are always rushing off to accomplish something, constantly feel insecure, and are angry when anything or anyone holds up their progress.² It appears that being competitive,

establishing and maintaining the “alpha” position, and chronically intimidating and beating any opposition is stressful and takes its toll on lifespan.^{23,42}

There are three basic elements of the Type A personality:⁴²

- Speed/impulse
- Competitiveness
- Anger/hostility

The first two elements allow for socially acceptable outlets to stress, such as through hobbies, sports, and in business. The third element, anger or hostility, has no personal or socially acceptable outlet, so it results in harmful wear and tear from repression.⁴²

Alternatively, people with Type B personalities (i.e., the calm, laid-back, easy-going types) almost never have coronary heart disease before 70 years of age even if they smoke, eat fatty foods and don’t exercise.⁴² Cooperative people who work and play well with others have a much lower stress level and live longer.²³

Repressive personalities are people who show no outward signs of stress at all.² They are people we tend to envy because they seem to have everything together and are hard-working, solid, and stoic. Personality tests show that they are not depressed or anxious, and they truly are mentally healthy, happy, productive, and socially interactive.² What is wrong is that they need social conformity, are uncomfortable with ambiguity, and dread social disapproval.² These individuals order their world to a high degree, dress the same way every day, drive the same way to work at the same time every day, eat the same foods each day, and avoid surprises.² Emotions tend to be one-dimensional and in black/white terms. Repressives inhibit negative emotions, but if they admit feeling them, they experience them in only one dimension. Non-repressives might say they feel a bit angry, a bit sad, and a bit disgusted, while repressives report steadfastly that they feel only one emotion.² Clearly, these people are actually working very hard to control factors in their life that might cause them stress and it is actually very stressful to construct a world without stressors!²

Life and work factors

Urban living reduces life expectancy by 2 years due to crime, traffic, stress and pollution.⁴² Living in a rural and village setting increases life expectancy by 1 year due to less stressful conditions.⁴²

Research in France looked at the effects of job stress on blood pressure.²⁴ It found that a worker’s individual feelings about their stress levels may actually lead to elevated blood pressure while at work.^{24,43} Individuals with the same job, lifestyle, and physical characteristics who don’t perceive the job to be stressful do not have elevated blood pressure at work.^{24,43}

Poverty

The only case where rank makes a difference in stress and disease is in the case of poverty.² Many studies show that the poor have the highest rate of life stressors and stress-related illness such as heart disease and hypertension. Poverty is also associated

with increased risks of respiratory disease, ulcers, rheumatoid disorders, psychiatric disease, and several types of cancer.² The prevalence of these diseases is *5-10 times* that of those at the top of the socioeconomic ladder.² Studies that control for factors such as smoking, hypertension, and triglyceride levels in the blood, show that these account for less than 1/3 of the variability in the data. Even in studies where people have access to socialized medical systems and receive regular checkups, the poor still get sicker more often.²

A recent study compared low and high Socio-Economic Status (SES) children and teenagers with regard to basal glucocorticoids and the processing of positive and negative attributes.⁴⁴ It was found that low SES children and teenagers have higher levels of basal glucocorticoids and they tend to process both positive and negative attributes in a more negative way.⁴⁴ In addition, this type of mental processing was significantly related to their basal glucocorticoid levels at ages 10, 12, and 14.⁴⁴

The poor are generally disenfranchised from society and lack flexible coping strategies and resources to carry out plans.² Lack of control and predictability, financial worries, the inability to do stress-reducing activities due to lack of time, money, and social support, and the danger of crime all lead to a highly stressful existence.²

Dealing effectively with life's demands

The way people cope with stressful events may be at least as important as the stressors themselves in determining health or illness.²⁸ Negative psychological traits can intensify the effects of stressors, while positive ways of coping may buffer the body from stress.²⁸ Long-term and repeated stress causes many physical problems as described in Part I.

Everyday stress

The first step in dealing with stress is to recognize the signs of the stress-response, admit there is a problem, and identify the situations most responsible for it.^{2,45} There are really two aspects to stress: external and internal. While it is always worth trying to change external situations that are destructive, we have a choice in how situations affect us.⁴⁶ Changing the external aspect of stress does not improve our ability to handle future problems.⁴⁶ Quitting your job, moving, or ending a bad relationship may be necessary in some cases, but it is important to affect the internal aspect of stress. Learning how to relax, protecting yourself from the harmful effects of stress, and dealing with the external aspects of stress is most effective.⁴⁶

Not all stress is bad and handling stress successfully makes us stronger mentally and physically. Stress of any kind can be the spice of life and often some of the happiest events in life are highly stressful, like starting a new job, getting married, even going on a trip to an exciting place.⁴⁷ Short-term stress in reasonable doses can have some positive effects:⁴⁷

- Increased energy and motivation
- Increased self-confidence
- Increased drive and productivity
- Enhanced work performance

- A feeling of excitement and a sense of purpose and challenge

Too little stress results in boredom and inefficiency.⁴⁸ Some people with sedate working lives may engage in hobbies and activities that are exciting, such as downhill skiing, watching suspenseful movies, or riding a roller coaster.⁴⁸ While some stress is stimulating and increases efficiency, there is a threshold that is different for each person at different points in life.⁴⁸ Beyond this peak, efficiency drops and tasks that were once easy are difficult to complete. If you are experiencing stress symptoms, you have gone beyond your optimal stress level and you need to reduce the stress in your life and/or improve your ability to manage it.⁴⁵

Self -Care

Our thinking is often backward when we experience symptoms that cannot be explained by medicine.⁴⁹ After visiting a long list of doctors, we are often relieved when we finally find one who can give us a diagnosis.⁴⁹ We would welcome even a dire diagnosis of physical disease than to admit that the problem may be stress-induced.⁴⁹ A great deal of this has to do with the fear of being classified as a hypochondriac or mentally disturbed.⁴⁹ Medicine is very slow to embrace the mind as a factor in health; it continues to attempt to identify specific factors that cause an illness and find pills and procedures to alleviate it. Now, about 75% of physicians are recommending mind/body approaches, but they do not embrace a multidisciplinary approach that includes self-care.⁴⁹ It is considered radical or intrusive to ask people to stop smoking, manage stress, exercise, and eat a healthy diet, but commonplace to perform heart bypass, angioplasty, or prescribe powerful drugs.³² Drugs and surgery can be life-saving in a crisis. People need permission to decide what course of action is right for them. The worst that can happen if someone practices stress management is that they learn to deal with stress. Unlike surgery or medications, there are never any serious side effects.³² The emotions of stress have very definite physical manifestations..

People who practice self-care and take control of their health become empowered. Self-care is multidisciplinary involving nutrition, stress management, personal outlooks, healthy habits, values and beliefs. Habits of a healthy lifestyle work together and do not follow the illness paradigm (i.e., the “pills/surgery” model).⁴⁹ For example, lifestyle changes can improve blood flow to the heart in approximately one month.³²

Stress started to emerge as a potential source of physical ailments in 1936, yet we are still more apt to run to the medicine cabinet to relieve aches and pains than to try relaxation or stress-management techniques.⁴⁹ We must learn to rely on prevention and self-healing, and to appreciate the natural healing properties of our bodies.

Try some herbs

Adaptogens are botanical substances that improve your body’s ability to adapt to stress regardless of the source.⁵² Adaptogens are completely safe and non-toxic, they have broad uses for health, and they specifically reduce both mental and physical stress.^{52,53} Not all herbal remedies are non-toxic, but this class of herbs can be taken without fear of side effects, though everyone has their own body chemistry, so discontinue use if any

unusual symptoms arise.^{52,53} Pregnant or nursing women should not use most herbal remedies.⁵³ Adaptogens are meant to be taken on a long-term basis.⁵³

- Ashwaganda
- Eleuthero
- Holy Basil (Tulsi)
- Maca
- Panax Ginseng
- Rhodiola Rosea
- Schisandra
- Reishi mushroom

Life Attitudes: The Hardy Personality and Thriving

Suzanne Kobasa at the City University of New York has studied and identified psychological coping strategies she calls *hardiness*, which is associated with resistance to illness.²⁸ This concept is a lot like the concept of *thriving* discussed earlier in this article.³¹ Kobasa identifies five characteristics of the hardy personality. These are:^{20, 28}

1. *Commitment* – Has a purpose in life and is being true to one's values. An active participant in life, not a bystander.
2. *Control* – Sets goals and priorities, works on first things first and checks them off as they are completed. Master of one's own destiny, not the pawn of fate.
3. *Positive Attitude* – Sees life as both good and bad, but emphasizes possibilities over problems, strengths over weaknesses, and potentialities over deficiencies in the situation and in self. Energized and focused to achieve goals
4. *Perspective* – Doesn't go into full-fledged fight or flight mode with every minor problem, hassle, or obstacle. Makes sure this is a hill worth dying on. Everything else is viewed with tolerance and patience. Believes matters of style, taste and individual differences enrich the world. In the final analysis, most matters are small matters.
5. *Relationships* – Gives love and is beloved by all creatures great and small. Facilitates caring relationships at home or work, and in the community. Concern for others is the most important characteristic. The physiological responses generated are life enhancing and life prolonging.

Lifestyle Changes

There are numerous strategies for modifying lifestyle to reduce stress. However, throughout the research there seems to be some agreement on basic changes that work in every situation:^{2,45,32,50,51}

- Determine what is stressful
- Be conscious about slowing down
- Exercise
- Eat right
- Follow the principle of moderation.
 - ❖ Experience stimulation in your life that is satisfying without being destructive.
 - ❖ Avoid excesses and extremes; strive for balance.
 - ❖ Seek balance between rest and work.
 - ❖ Enjoy others company, but take pleasure in solitude as well.

- ❖ Do something every day for each dimension of your being: spirit, mind, and body.
- ❖ Moderation is especially important when you are sick.
- Make long-term changes that work for you.
 - ❖ Biofeedback and meditation have proven helpful to a majority of people.
 - ❖ Cognitive behavioral therapy can teach people to change how they think and respond to stress. 6-8 weeks of therapy is typical. It can be very helpful for panic attacks.
 - ❖ Medication may be helpful if you experience panic attacks that interfere with life.
 - ❖ Support groups can help discover tips to deal with feelings of stress, isolation, and loneliness.

Another look at stress reduction options based on our current knowledge of health risks of stress suggests the following five approaches to life:²

1. Find an outlet for life's frustrations and set aside time to do it regularly. This should be something you find personally compatible - whether it's prayer, meditation, ballroom dancing, therapy, or sports – and that works for you in your life. Clearly, asking a homeless person or someone struggling with two jobs and a family to take up a hobby is ridiculous, but silent prayer or meditation while riding the bus could help.
2. In the face of terrible news beyond your control, beyond prevention, or beyond healing, some denial may be the only means of sanity. With less severe problems, hope for the promise of improvement is most effective without denying that things may not improve. Being hopeful, but prepared for the worst, will protect you from the damaging effects of total denial.
3. Seek control, but do not assume control over the past, things that are uncontrollable, things that are not broken, or things that are broken beyond repair. A wall of stress can be scaled step by step, not with a single breakthrough.
4. Seek predictable, accurate information at a time and in an amount that is helpful. Too much or unnecessary information makes stressful situations worse. Information that is too early or late is also counter-productive.
5. Find sources of social affiliation and support, but recognize who are true friends rather than just social acquaintances. Being married is associated with numerous positive health outcomes, but being in a bad marriage is associated with immune suppression.

Personal Style

Deciding where to start and which things will work best for you is sometimes daunting. A series of studies found that different people actually need to accomplish stress control skills in a different order, based on their own personal style.⁵⁰ People who started working on the wrong skill actually increased their stress, so where you start is quite important.⁵⁰ These studies identified five basic, proven stress control skills:⁵⁰

- Clarifying your personal values and daily satisfiers
- Being able to relax at will, anywhere, any time
- Developing rewarding relationships
- High-performance nutrition
- Essential exercise

The first step is to identify your dominant Stress Type. Next, focus on the two skills from the above list that are most important for your type, which will give you 65% progress. Later, identify your secondary Stress Type and focus on the skill associated with that type.⁵⁰ Note that these are lists of very broad and negative characteristics. The authors of this article actually hesitate giving this information because it's difficult for people to identify with a negative stereotype. However, it may be helpful, in a general sense, to determine the specific areas on which to focus, even if you don't fit any of these Stress Types very well.

The results of the 3224 participants in this study were impressive in measures taken four and eight months after starting the program.⁵⁰ The numbers below are the percentage of participants showing a given improvement.⁵⁰ The average "body age" decrease was 3.5 years at 4 months and 11.4 years in 8 months.⁵⁰

Measure of improvement	% at 4 months	% at 8 months
Decrease in work absenteeism	42	56
Decrease in doctor visits	28	53
Below target blood pressure	51	91
Immunoglobulin A increase	24	31
T cell increase	21	28
Triglycerides within target range	43	64
Increased comfort with self – 6 factors	41	62
Anxious mood and depression improvement	32	68
Stress hyper-reactivity decrease (EMG and GSR measures)	41	49
Stress recovery time decrease (EMG and GSR measures)	28	38
Increase IN ability to relax at will (EMG and GSR measures)	17	37

Stress Type 1: The Speed Freak

Characteristics of this stress personality are:

- Constant foot to the floor on stress accelerator
- Borderline workaholic or perfectionist
- Everything must get done 110% effort, no matter how unimportant the task is
- Rapid speech; interrupts others frequently
- Periods of deep fatigue after all-out effort

Two most important skills:

- Clarify life goals you value most

- Learn relaxation and breathing techniques to control how you invest energy in those goals. Please read our article on Breathwork:
http://working-well.org/articles/pdf/Breathing_2015.pdf

Stress Type 2: The Worry Wart

Characteristics of this stress personality are:

- Has trouble turning off their thoughts
- Drive themselves at high RPM, but rarely put themselves in gear for action
- Paralysis by analysis; useless spinning worry
- Frequent anxiety; tension headaches
- Slow to recover from high-stress situations

Two most important skills:

- Psychological relaxation or reframing
- Clarifying values and goals

Stress Type 3: The Drifter

Characteristics of this stress personality are:

- Tend to spread energy across many options
- In perpetual “mid-life crisis”: feels dissatisfied; something is missing in their lives
- Doubt their existing goals
- Don’t buy into anything very deeply

Two most important skills:

- Self-affirming relationships
- Identify the satisfying experiences you value most in those relationships. Plan one or two enjoyable activities that really benefit from having a partner.

Stress Type 4: The Loner

Characteristics of this stress personality are:

- Giving or receiving relaxed closeness or intimate sharing is difficult
- Feel uncomfortable with others; often masked with a smile
- Feel lonely, often unfulfilled in relationships
- Feel alone in carrying burdens or worries
- Often cancel social events at the last minute

Two most important skills:

- Clarify what you value and truly enjoy in work or personal life
- Cultivate relationships that affirm you

Stress Types 5 and 6: Basket Cases and Cliff Walkers

The secondary Stress Types for these two types is usually different, but the primary skills to tackle are the same.

Characteristics of Basket Cases are:

- In constant “energy crisis”/overload mode: Energy often fades by midday
- Frequent aches and pains in muscles or joints
- Sometimes depressed; feel most activities are too much to do

Characteristics of Cliff Walkers are:

- A walking risk factor chart – high blood pressure, smoking, alcohol misuse, no exercise
- Believe they are impervious to their bad habits
- Usually have a somewhat worn appearance
- Difficulty sustaining energy

Two most important skills for both Basket Case and Cliff Walkers are:

- High performance nutrition
- Essential exercise

Coping Strategies

Coping strategies are ways of dealing mentally with stressful events, as opposed to stress management techniques which are long-term lifestyle changes. Lifestyle changes are important from the “big picture” standpoint, but coping strategies can help you learn to deal with life’s ups and downs in the immediate situation.

One study in the 1960’s looked at parents of children with cancer and identified several coping styles associated with reduced glucocorticoid levels, the measure of stress experienced.² These things appear to help people mentally **deal with potentially devastating news**.

1. Displace worry about the worst outcome to something less threatening. In the case of this study, this could be: “If I go away, the child might miss me” rather than: “If I go away the child might die”.²
2. Denial works...sometimes. If a child with cancer went into remission, the parent who felt the battle had been won and the child would be healthy did better than the parent who anxiously fretted over the child, watching for signs of illness. Unfortunately, in all cases remission did not last. Those who had used denial had the highest stress response.²
3. Have faith. Parents who felt that they had been chosen because they were best able to handle this task did better than those who had no religious beliefs or denied there is a god. The person who believes that God has a plan has the benefit of attribution. A person who follows certain rules or rituals and believes that things will be better has the benefit of both attribution and predictive information. If the belief is both of these things, and that God responds to your entreaties, there is the additional benefit of control. Finally, if a person believes that God is loving, there is the greatest reduction in stress.²

The following are **coping strategies** that are timeless and apply to all people.^{20,51}

1. **Set priorities.** Consider what is important to you (e.g., work, family, education). If you don’t do the most important things first, you will always feel frustrated and unfulfilled.
2. **Express emotions honestly.** By laying things on the table with others, you can deal with what is bothering you rather than letting it fester.
3. **Learn to laugh.** Try to view life’s annoyances as amusing...and certainly don’t take everything as a personal affront to you!

4. **Don't try to be superhuman.** Tolerate some imperfections and don't try to be all things to all people. Avoid over promising, over scheduling, and over committing (a very common problem of Type A personalities). Learn when, how, and why to say *no*. Most people can handle a maximum of four major commitments at any one time and do them well, such as family, work, education, and community service. Adding another major commitment leaves no room to deal with inevitable emergencies.
5. **Share the load.** Delegate tasks. When you are overloaded, get others to help. It has major benefits: it develops other people, overall performance increases, and personal health improves.
6. **Escape for a while.** Leave room for needed breaks; don't always rush from place to place without time for a rest or pause. Breaks can be small (e.g., the "coffee break") or larger, such as a day of rest or an annual vacation. All pauses are refreshing.
7. **Use a "decompression chamber" technique.** Learn to leave the pressures, conflicts, and frustrations of one part of your life behind you when you enter another part. Leave work at work and home life at home by structuring a decompression chamber into your daily life. This can be on your commute back and forth to work, or simply setting aside time between activities where you review past events, rehearse upcoming activities, and relax.
8. **Talk with others.** Discussing things that bother you with a person you trust can relieve tension, add perspective, and help you figure out what to do. Some people find this very difficult to do, but the more isolated you become, the more desperate your situation may seem. Only 10% of the people you know probably care and want to help, so choose who you talk to carefully. Turning to an authority figure may or may not be the right thing to do, but family and friends, especially having a family meeting, can be a very effective coping technique.
9. **Go easy with criticism.** Do not be too demanding of yourself, expecting perfection. You may have trouble feeling good about accomplishments if everything doesn't turn out well, which results in lowered self-esteem and depression. If you expect others to be perfect, you will feel disappointed, angry, and frustrated when they fail to measure up. Type B personalities usually go easy on criticism and typically take a live-and-let-live attitude.
10. **Worry less and do more.** If you can solve a problem, do so, but don't worry about what you cannot change, no matter how important it is...and definitely don't worry about unimportant matters.
11. **Enjoy the little things in life.** There are many small pleasures available to us. Happiness is generally found in these experiences rather than expecting big peaks of ecstasy. If you need help with this, please refer to our article on Mindfulness (<http://working-well.org/articles/pdf/Mindfulness.pdf>).
12. **Help another person.** Thinking about you is healthy, but self-absorption can lead to a loss of concern for the external world, especially the health and well-being of others. Related to this is strong personal commitment. Decide who and what is really important to you and take action that supports your values and goals and strengthens your relationships.
13. **Handle hassles healthfully.** There are often predictable times when hassles tend to be high such as holidays, certain meetings, and family get-togethers. In dealing with these, be realistic and don't expect every moment to be perfect. Keep things simple,

and share the tasks. Ask yourself these questions: What is the worst that can happen, on a scale of 1-10? Who and what are important? How does this hassle affect them? A month from now, will you remember this hassle?

14. **Have a hobby.** Find an activity that is intrinsically satisfying to you (e.g., reading, gardening, church, volunteer work, or music). Consider what you enjoyed doing when you were young!
15. **Accentuate the positive.** Do not close your eyes to the truth, but avoid negative thinking. A positive attitude helps you tolerate life's ups and downs and it is contagious to others you are around. Reframe or change the way you interpret an event or situation; rather than seeing an upheaval, see an exciting adventure or challenge. Instead of saying "I'm too old", say "I'm experienced and capable".
16. **Improve job proficiency.** In the workplace, developing technical skills, increasing practical experience, and learning better skills for communication, teamwork, and effective use of time are all very helpful in reducing stress. For management, improving leadership, delegation, and coaching skills help reduce job stress for you and your employees.
17. **Trust in time.** Although time may not heal all wounds, it often helps. You may even be stronger for having experienced a painful or stressful time.

Revised and updated July 6, 2016

This article and all of our articles are intended for your information and education. We are not experts in the diagnosis and treatment of specific medical or mental problems. When dealing with a severe problem, please consult with a healthcare or mental health professional and research the alternatives available for your particular diagnosis prior to embarking on a treatment plan. You are ultimately responsible for your own health and treatment!

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