# Data

### [**Impact of Stress on Success (GPA)**](http://docs.google.com/iostress.htm) | [**Physical Effects of Stress**](http://docs.google.com/peffects.htm)

Everyone knows that stress has very real physical effects. It is the cause of many ailments experienced on a regular basis. Why does stress effect humans so severly? How does it work? To answer these questions, one must take a closer look at the body's immediate reaction to a stressful situation. It is the initail response of the body which will eventaully lead to physical harm if the stressor is not removed. By looking at the natural response to stress, one is able to better understand why it effects the body in such a large way.

Since everyone will react to stressors in a different way, researchers classify stress according to the legnth of time it occurs. There are immediate stressors which are things such as waiting to see the dentist or standing in a line. Chronic stressors are events such as commuting, which cause stress on a regular basis. The third type of stressors are the long term, or life altering changes, such as losing a job or the death of a spouse. People can respond in different ways to the same stressor, causing intense effects of stress in one person, while hardly effecting the other.

A person's reaction to stress can be divided into two broad catagories: psychological and physiological reactions. A person's psychological response to stress is much less predictable than their physical response. "A stressor sets in motion a series of bio-chemical and neurological changes that is much the same regardless of the stressor." (Constable) This response is refered to as the general adaptaion syndrome, and is a natural response. A person's psychological repsonse, on the other hand, will vary depending on their mood, and emotional stabiliity. A person might react in different ways, psychologically, to the same stressor on two different days. The bodys' response is refered to as the "fight or flight" response. Named by physiologist Walter B. Cannon, a change in hormones prepares a person to either stay and deal with the stressor set before them, or to remove themself from a stressful situation.

There are three stages to the body's reaction to stress. The immediate reaction is alarm. The stage of alarm is what most people consider the fight or flight stage. The mind and body, in this stage, are preparing to take action. A person will be extremely alert to their surroundings, but very anixious and unable to concentrate. The body will slow down systems, such as the digestive system, that are not vital in responding to the stressor. This causes a neverous stomach. The body will also begin to perspire in an attempt to cool off the body, allowing it to burn more energy. The alert stage of response will only last until the stressor is removed or the body adjust to the stressor and enters the second phase, resistance.

The resistance phase of the stress reaction will reverse the alertness phase. "During this phase the body's systems return to normal, but they remain alert to respnse to the stressor." (Constable) If successful, the body will no longer show physical signs of stress. Most of the time the resistance phase is only successful in reversing the fight or flight response if the stressor is removed. Otherwise, the body will remain in the hightend stage of awareness, although less severe than that seen in phase one. If the body remains in this state, it will eventually use up all of the energy and resources that were created to deal with the stressor. This is when the body enters the exhaustion phase.

Stage three is simply the body's way of telling a person it can no longer deal with the stressor. In this stage, the body's ability to cope with stress is gone. Burnout, or exhaustion, results when your body runs out of resources to fight stress. A consequence of this burnout is a lowered immune system, leading to an increased susceptibility to illness. At this point, the body "can no longer resist the stressors and becomes vulnerable to dysfunction and disease." (Constable) In other words, the body is capable of creating resources and energy to fight stress through the release of hormones, but if the stress is not dealt with or removed, these resources will become depleted, leaving the body defenseless to the effects a stressor can cause.

Exposure to any stressor, good or bad, will cause a chemical change in a person's body. The normal response of the body is refered to as the general adaptation syndrome. When confronted with a stressful situation, the body will send a message to an area of the brain called the Hypothalamus. This area of the brain will then send signals to the adrenal and pituitary glands. After these two glands have been stimulated, the body is in the "fight or flight" response. The activity of these glands is responsile for the way people feel and physically react to stress. There are three main reactions caused by their stimulation: " ... (1) a surge of adrenalin, (2) a discharge of cortisol, and (3) a release of endorphin." (Golisek)

Adrenalin is the main chemical invovled in the physical reaction to stress. The increased levels of adrenalin will increase a person's heart rate and blood flow. This is an important reaction because this, in turn, will increase the blood flow, which helps to bring extra oxygen to the body. Oxygen is critical in "driving biochemical reactions, regulating blood gases..., and pumping extra energy into (the) system." (Golisek) Adrenalin also increases the amount of glucose, or sugar in the blood, that is in the body. Glucose is critical in providing energy for the body, and when in a stressful situation, the body will flood cells with an abundance of glucose, giving them the energy they might need in order to respond to the stressor. There are many noticable physical effects of the increase of adrenalin. The heart may begin to pound, speeding up to"... force blood to parts of the body that need to take action." (Youngs) Someone might also experience a "second wind" which is the increase in alertness, and strength due to the high concentration of sugars in the blood.

Cortisol is another chemical the body will produce in a stressful situation. It causes an increase in both blood amino acids and blood sugars. The amino acids are crucial since "many types of stress lead to tissue damage, (and) amino acids....are crucial for the proper recovery of....damaged tissues." (Golisek) The increased amount of blood suger adds to the abundance of available glucose in the body and gives a person more energy.

The release of endorphin, a morphine type substance which is several hundred times more potent than morphine, is the body's "natural tranquilizing system." It is released from a person's brain any time they are exposed to stress, pain, excercise, or an emergency situation. The unifying concept of stress is that it doesn't matter what the source of stress is - the results are always the same. Our bodys' natural response to the conditions around us have developed over time, as stressors in our evolving world have changed. Even in today's technological era the mysteries of stress are difficult to decipher.

<<<Source: Breaking the Stress Habit

This flow chart shows where each of the three main chemicals involved in the stress reaction come from and how they effect the body.

>>>Source:Stress and Your Child

This picture shows the "nonspecific demand for response activity" that the body goes through every time in incurrs stress. This generic response to any type of stressor is designed to supply the body with energy.

Source: Managing Stress from Morning to Night