Some people turn to chocolate in times of stress. Others go for a run. What about trying the old saying that laughter is the best medicine? Is there any scientific proof that laughter is an effective stress buster?

The answer lies in the body’s responses to stress and laughter. Everyone is familiar with stress. People commonly refer to being “stressed out” when they are feeling anxious or fearful. In everyday language, stress is a negative reaction to a situation. In biology, however, stress can be either good or bad for the body.

Stress is the body’s response to anything that disrupts the body’s equilibrium, or homeostasis. Most of the body’s processes are designed to maintain homeostasis. Think about the body’s responses to changes in temperature. In a hot environment, the body sweats to lower the body temperature. In a cold environment, the body shivers as it tries to generate warmth and increase the body temperature. Both responses are efforts to bring the body temperature back to a homeostatic balance.

It might seem like stress would throw the body off balance and move it out of equilibrium. Like most things in biology, however, the situation is more complicated. The stress response is actually the body’s attempt to return to homeostasis.

Scientists divide stress into short-term and long-term responses. An example of a short-term response is the fight-or-flight response. Think about a student crossing the parking lot at school. Suddenly a car comes roaring around the corner, racing by him with only inches to spare. The body’s response to this type of scare is immediate: the student’s heart is pounding, his breathing rate is fast, his body is shaking, and his eyes are wide open.

These physiological responses are caused by the rapid release of a hormone called adrenaline (or epinephrine) into the blood. The adrenal gland dumps this hormone into the blood to trigger all these reactions in the body when it is in a dangerous situation. The heart starts beating faster to deliver oxygenated
blood to the skeletal muscle. This enables flight away from the source of danger. The rate of breathing increases to bring more oxygen into the blood to support this muscle activity. In this case, the body’s response to a stressful situation is positive because it supports activities that get the body away from the dangerous situation. Once the stressor is gone, the body returns to homeostasis.

Long-term responses to stress are a different matter. When faced with a stressful situation, the body responds by activating the endocrine system. The endocrine system uses hormones to send messages throughout the body. Unlike the rapid communication of the nervous system, the endocrine system acts slowly. It causes longer-lasting changes in the body than the nervous system does.

The hormones released during the stress response include a hormone released from the adrenal gland, called cortisol. Under non-stress conditions, cortisol helps the body maintain normal processes. These processes include maintaining blood sugar levels, blood pressure, and normal immune system function. However, during periods of severe or prolonged stress, cortisol becomes dangerous.

Among the negative effects of cortisol on the body during times of severe stress are:

- inhibition of the immune system, decreasing the body’s ability to fight infection
- decreased reproductive functions and body growth
- increased fat storage, especially in the belly

These responses play an important role in keeping the body in homeostasis. When the body is under stress, cortisol works to give the body energy (increased blood sugar) and to store energy for future use (fat storage). It also stops putting energy into processes unnecessary for maintaining life (growth and reproduction). From a long-term perspective, these outcomes help the body survive in times of stress, such as when food supplies are scarce.

However, these same responses can be triggered by non-life-threatening situations, such as stress from school and social
situations. These situations are not life threatening, but they trigger these physiological responses. Why is this bad?

Chronic exposure to stress and the constant activity of stress-related hormones have negative consequences. Scientists have documented that chronic stress can cause decreased bone density, suppressed immune function, difficulty with memory, increased blood pressure, and increased rates of heart disease.

How does laughter help with stress? Scientists have discovered a number of health benefits, including:

- Scientists at the University of Maryland showed that watching a comedy helped increase blood flow in people who watched the movie. In contrast, people watching a serious drama experienced *vasoconstriction*, which restricts blood flow. The people who watched the comedy also had decreased blood pressure.
- A number of studies suggest that laughing increases the number of infection-fighting antibodies and immune system cells, enhancing the body’s ability to fight infection.
- One study even showed that anticipating a laugh reduces stress hormones in the body.

Although scientists are still exploring exactly how laughter decreases stress, it is clear that the old saying that laughter is the best medicine really is true. The next time a stressful situation hits, find a friend and share a joke to laugh the stress away.