Adrenaline, Cortisol, Anxiety and Breathing

You're riding your bike when suddenly a car screeches its brakes and stops just a few feet away from you…A parent screams into your room, "I know what you did! Now get down here this instant!"…You open your backpack and you realize you left your homework binder at home…each of these incidents has the potential to cause your body to produce **adrenaline**.

When stressful situations occur, a series of chemical reactions begins in the amygdala and eventually causes your **adrenal glands** to release adrenaline (also known as epinephrine), the famous "fight or flight" hormone.

You experience increases in breathing, heart rate, and blood pressure. Blood flows faster to the muscles needed for fighting or fleeing, and you have plenty of energy to do either, because adrenaline causes a rapid release of glucose into your bloodstream. Also, your senses become keener, your memory sharper, and you are less sensitive to pain.

Other hormones shut down functions unnecessary during the emergency. Growth, reproduction, and the immune system all go on hold. Blood flow to the skin is reduced. That's why chronic stress increases your chances of getting sick and often manifests as skin ailments. With your mind and body in this temporary state of metabolic overdrive, you are now prepared to respond to a life-threatening situation.

So far, so good. Adrenaline is a great way for our body to help keep us alive.

But…

Anxiety is the experience we have when the body and mind are reacting to *safe* conditions as if a threat to *survival* were present. "I'm so worried about the play"... "Will I make the team?"… "This test is going to be so hard"… "I'm really worried that she doesn't like me"…

Adrenaline isn't needed in the face of "minor" problems. And what's worse, in the presence of long-term *perceived* threats, the adrenal glands later release another hormone called **cortisol**. If you often feel "stressed", the chances are you're producing high levels of cortisol. Small amounts of cortisol have some positive effects similar to the positive effects of adrenaline, but higher and more prolonged levels of cortisol in the bloodstream (like those associated with chronic stress) have been shown to have negative effects:

- Impaired cognitive performance
- Blood sugar imbalances
- Decreased bone density
- Decrease in muscle tissue
- Higher blood pressure
- Lowered immunity

- Increased abdominal fat, which is associated with a greater amount of health problems than fat deposited in other areas of the body. Some of the health problems associated with increased stomach fat are heart attacks, strokes, the development of higher levels of "bad" cholesterol (LDL) and lower levels of "good" cholesterol (HDL), which can lead to other health problems!

Excessive cortisol can make it difficult to think or retrieve long-term memories. That's why people get befuddled and confused in a severe crisis. Their mind goes blank because "the lines are down." They can't remember where the fire exit is, for example.

But the 21st century world is such a fast-paced, competitive place, how can we ever hope to not feel stress and not produce high levels of health-harming cortisol?

The answer? **Relax**. Exercise, play games, meditate, do yoga, have a hobby…and simply **breathe**. Get rid of activities that are crowding your "schedule", and encourage your entire family to do the same. Getting rid of stress is crucial to your long term health. If you feel stress, try *doing* less and *breathing* more.

Here's a breathing exercise you can do right now.

- Exhale completely.
- Then slowly breathe in through your nose.
- Expand your diaphragm/belly to bring air into the lower portion of your lungs.
- As you gradually fill your lungs from bottom to top, expand your chest.
- At the end, lift your shoulders for a last bit of volume.
- Briefly pause your breathing (and your thoughts).
- Then relax and let the air flow smoothly and fully out through your mouth.
- Pull in your stomach at the end to expel the last bit of air (and stress).
- Enjoy the emptiness for a few seconds.
- Then begin another breath.
- As you do this a few times, pay attention to the sound and sensation of your breath. If you get light-headed at first, then breathe normally.

The Stress Management and Counseling Center in New York recommends a breathing technique for rapid relaxation. According to program director and practicing psychologist Allen Elkin, Ph.D.: "You take a deep breath, deeper than normal, and hold it in until you notice a little discomfort. At the same time, squeeze your thumb and first finger together (as if you were making the okay sign) for six or seven seconds. Then exhale slowly through your mouth, release the pressure in your fingers, and allow all your tension to drain out. Repeat these deep breaths three times to extend the relaxation. With each breath, allow your shoulders to droop, your jaw to drop and your body to relax."

Sources: Ron Kennedy, M.D., Santa Rosa, California
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