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How Stress Influences Your Heart Attack and Stroke Risk

Analysis by Dr. Joseph Mercola | January 13, 2024

STORY AT-A-GLANCE

- Stress increases your risk of heart attack and stroke by causing overactivity in your amygdala — your brain's fear center, which is activated in response to both real and perceived threats
- People who are highly stressed have higher activity in the amygdala. This in turn triggers arterial inflammation, which is a risk factor for heart disease, including heart attacks
- High stress also raises your level of disease-promoting white blood cells, and releases norepinephrine, which can cause dispersal of bacterial biofilms from your arterial walls, thereby triggering a heart attack

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Stress has enormous implications for your health. From an evolutionary perspective, the stress response is a lifesaving biological function that enables you to instinctively square off against an assailant, run away from a predator or take down a prey.

However, those of us living in the modern world are now activating this same biological reaction in response to activities and events that have no life-threatening implications whatsoever, from speaking in public to filling out tax forms and sitting in traffic jams.

The sheer number of stress-inducing situations facing us on a daily basis can actually make it difficult to turn the stress response off, and marinating in corrosive stress hormones around the clock can have very serious consequences for your health.

Stubborn fat accumulation, high blood pressure and heart attack are just a few of the many health consequences associated with chronic stress. Acute stress can also have potentially lethal consequences.

I have written about broken heart syndrome — a condition prefaced by acute and severe stress or shock, such as the unexpected death of a loved one.

High-Stress Lifestyle Raises Your Risk of Heart Attack

There's no shortage of evidence showing that stress impacts your health. And, since your heart and mind are so closely interlinked, your mental state can have a particularly significant influence on your heart health.

According to research, stress increases your risk of heart attack and stroke by causing overactivity in your amygdala.[1,2,3] Known as your brain's fear center, this almond-shaped brain region, located in your temporal lobe, is activated in response to both real and perceived threats.

Other research suggests the amygdala is also involved in the processing of other emotions, including positive ones, as well as the processing of emotional memories of all kinds. Still, its involvement in fear and threat detection is well-established, and one of its most basic jobs is to keep you safe by biochemically preparing you to fight or flee as needed.

In this study, inflammation levels as well as brain and bone marrow activity of 293 participants were measured. All of the participants were over the age of 30, and none had a diagnosed heart problem. By the end of the observation period, which lasted between two and five years, 22 participants had experienced a serious cardiac event such as heart attack, stroke or angina (chest pain).

Based on brain scans, the researchers were able to conclude that those with higher activity in the amygdala were at an elevated risk of a cardiac event. As it turns out, there appears to be a significant correlation between amygdala activity and arterial inflammation (which is a risk factor for heart attack and stroke).

This was confirmed in another much smaller sub-study involving those with a history of post-traumatic stress disorder (PTSD).[4,5] Here, levels of C-reactive protein were also measured, showing that those reporting the highest stress levels also had the highest amygdala activity and higher levels of inflammatory markers.

Overactive Fear Response Is a Recipe for Heart Attack and Stroke

In short, people who are highly stressed have higher activity in the amygdala. This in turn triggers inflammation, which is a risk factor for heart disease. These findings are not concrete proof of causation, however, and need to be validated through further research.

That said, previous studies have shown that activation of the amygdala can trigger arterial inflammation by triggering immune cell production in the bone marrow. As reported by The Huffington Post:[6]

> *"A healthy amygdala can help to protect the brain against stress, while an amygdala that's hyper-excitable as a result of chronic stress or other factors can amplify the stress response.*
>
> *The new study shows, for the first time, how an overactive amygdala can cause heart attack and stroke. When stress triggers the amygdala, it activates bone marrow and inflammation of the arteries to create the conditions for a heart attack.*
>
> *'Our results provide a unique insight into how stress may lead to cardiovascular disease,' Dr. Ahmed Tawakol, a Harvard cardiologist and the study's lead author, said … 'This raises the possibility that reducing stress could produce benefits that extend beyond an improved sense of psychological well-being.'"*

Ilze Bot, Ph.D., a Dutch biopharmaceutical researcher who wrote an accompanying commentary to the study, added:[7]

"In the past decade, more and more individuals experience psychosocial stress on a daily basis. Heavy workloads, job insecurity or living in poverty are circumstances that can result in chronically increased stress.

These clinical data establish a connection between stress and cardiovascular disease, thus identifying chronic stress as a true risk factor for acute cardiovascular syndromes, which could, given the increasing number of individuals with chronic stress, be included in risk assessments of cardiovascular disease in daily clinical practice."

Other Ways Stress Can Trigger a Heart Attack

Stress can also promote or trigger a heart attack in other ways. For example, studies[8] have shown that as your stress level rises, so do your level of disease-promoting white blood cells, and this is yet another way by which stress can lead to atherosclerosis, plaque rupture and myocardial infarction.

During moments of high stress your body also releases norepinephrine, which researchers claim[9] can cause the dispersal of bacterial biofilms from the walls of your arteries. This dispersal can allow plaque deposits to suddenly break loose, thereby triggering a heart attack.

A sudden release of large amounts of stress hormones and rapid elevations in blood pressure may even trigger a heart attack or stroke even if you don't have a heart problem. In the case of broken heart syndrome, the symptoms of a heart attack occur even though there's no actual damage to the heart at all.

According to the British Heart Foundation (BHF), broken heart syndrome is a "temporary condition where your heart muscle becomes suddenly weakened or stunned." The left ventricle (your heart's largest chamber) also changes shape, which adds to the temporary dysfunction.

This sudden weakness of the heart is thought to be due to the sudden release of large quantities of adrenaline and other stress hormones. This is what is believed happened

to Debbie Reynolds.

Adrenaline increases your blood pressure and heart rate, and it's been suggested it may lead to narrowing of the arteries that supply blood to your heart, or even bind directly to heart cells allowing large amounts of calcium to enter and render the cells temporarily unable to function properly.

While most will successfully recover, in some, the change of shape of the left ventricle can trigger a fatal heart attack. Having a history of neurological problems, such as seizure disorders, and/or a history of mental health problems is thought to raise your risk.[10] On the upside, while the condition can be life-threatening and requires immediate medical attention, it's usually a temporary condition that leaves no permanent damage.

Recognizing the Signs of Stress

Many have gotten so used to being wound up into a stress-knot, they don't even realize the position they're in. So, the first step is to recognize that you're stressed, and then take steps to address it. Common signs and symptoms of stress include:[11]

Sleeping poorly, trouble falling asleep and excessive tiredness	Binge drinking
Lack of appetite or overeating	Having a "short fuse"/being quick to anger or losing your temper
Feeling overwhelmed, sad or irritable; frequent crying or quick to tears	Headaches and/or general aches and pains

Releasing Your Amygdala's Death Grip

Knowing the amygdala's role in inflammation and heart attacks, it seems reasonable to conclude that part of the answer is learning to reduce the activity in your amygdala. When your amygdala is triggered by a real or perceived threat, oxygen is shunted from

your internal organs, including your brain, to the extremities. Essentially, your body is prepared for fighting — not thinking! After all, thinking is of little use when facing a man-eating foe. Muscle function takes precedence.

However, in today's world, critical thinking is really what's required when facing a stressful situation, be it a traffic jam or an interpersonal difficultly. Fist-fighting is not the most appropriate solution here, yet because of the stress response, your brain has largely been shut off. Step one, then, is to bring oxygen back to your brain.

Other Helpful Breathing Methods

There are many very good breathing techniques out there that will likely do the trick. You may want to experiment with a few different ones to see if one works better than another. Another one I like is the 4-7-8 breathing exercise taught by Dr. Andrew Weil.

1. Sit up straight and place the tip of your tongue up against the back of your front teeth. Keep it there through the entire breathing process
2. Breathe in silently through your nose to the count of four, hold your breath to the count of seven and exhale through your mouth to the count of eight, making an audible "whoosh" sound. That completes one full breath
3. Repeat the cycle another three times, for a total of four breaths. After the first month, you can work your way up to a total of eight breaths per session

A third method is the controlled breathing method taught by Patrick McKeown, one of the top teachers of the Buteyko Breathing Method. If you're experiencing anxiety or panic attacks, or if you feel very stressed and your mind can't stop racing, try the following breathing sequence.

Its effectiveness stems from the fact that it helps retain and gently accumulate carbon dioxide. This not only helps calm your breathing but also reduces anxiety. In short, the urge to breathe will decline as you go into a more relaxed state:

1. Take a small breath into your nose, followed by a small breath out

2. Hold your nose for five seconds in order to hold your breath, and then release your nose to resume breathing
3. Breathe normally for 10 seconds
4. Repeat the sequence several more times

Countering Stress With the Relaxation Response

Once you've addressed the oxygenation of your brain, next, engage in some sort of physical relaxation technique, as the stress response causes the muscles in your body to tighten. One simple one that can be done anywhere is to tighten the muscles in an area for a few seconds, and then release; moving from section to section. Start with your feet and legs, and move upward. This may even be done in concert with your breathing exercise of choice.

Visualization techniques such as those taught by Dr. Martin Rossman, author of "The Worry Solution," can also be helpful. Imagery is the natural language of your brain, which is in part why visualization and guided imagery exercises are so powerful for changing thoughts and behavior.

As noted by Rossman, the three keys to calmness are breathing, relaxation and visualization. Ideally, do all three. Here's Rossman's suggestion for pursuing calmness: Breathe and relax your body part by part, then imagine being in a beautiful, peaceful place where you feel safe. This could be either a real or imaginary place. Spend 10 or 20 minutes there, actively visualizing the serenity of your surroundings, to interrupt the stress response.

This will disengage your fight or flight response, allowing your physiology to return to equilibrium, or what is also termed "the relaxation response." This is a compensatory repair, renew and recharge state that brings you back to balance.

Mindfulness training — which focuses on being present in the moment — is another strategy that can be very helpful. In one study, people who participated in 10 sessions over the course of one month experienced "significantly decreased" stress, anxiety and

depression.[12] Mindfulness meditation is a more formal practice of mindfulness, in which you consciously zone in on, or focus your attention on, specific thoughts or sensations, then observe them in a non-judgmental manner.

The Emotional Freedom Technique Is a Targeted Technique You Can Use for Stress Relief

Last but not least, energy psychology techniques such as the **Emotional Freedom Techniques (EFT)** can be very effective for reducing stress by helping you to actually reprogram your body's reactions to the unavoidable stressors of everyday life. This is important as, generally speaking, a stressor becomes a problem when:

- Your response to it is negative
- Your feelings and emotions are inappropriate for the circumstances
- Your response lasts an excessively long time
- You're feeling continuously overwhelmed, overpowered or overworked

EFT is not the same thing as mindfulness; it is entirely different and used for different purposes. I regard mindfulness and meditation as tools that are useful for your entire life, like exercise for your mind. Ideally, you should strive to be mindful and use meditation daily.

EFT is different in that it works best for targeted stress relief, such as recovering from an emotional trauma or overcoming an addiction. You might only need to use EFT a few times throughout your life, while mindfulness and meditation are life-long endeavors.

When you use EFT, simple tapping with the fingertips is used to input kinetic energy onto specific meridians on your head and chest while you think about your specific problem and voice positive affirmations.

This combination of tapping the energy meridians and voicing positive affirmation works to clear the "short-circuit" — the emotional block — from your body's bioenergy system,

thus restoring your mind and body's balance, which is essential for optimal health and the healing of chronic stress.

While the video above will easily teach you how to tap for stress, it is important to realize that self-treatment for more serious issues is not recommended. For serious or complex issues, you need an experienced practitioner to guide you through the process, as there is an incredible art to it; it typically takes years of training to develop the skill to tap on deep-seated problems.

Sources and References

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