

How a TV series showed what happens to your body when you're stressed

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Your heart starts racing, your mouth goes dry and sweat beads on your forehead. We've all been there, caught in a moment of stress. When you encounter a situation that threatens your safety, your brain must make a critical decision—how to react to the danger at hand.

This is a phenomenon my colleagues and I explore in the program [Michael Mosley: Wonders of the Human Body](#) on Channel 5, [the late doctor and presenter's](#) final TV series. He died in June this year.

A team of us from Bangor University took Michael out of his normal comfort zone to complete an activity with a very high potential risk. We then monitored his body to measure his [stress response](#). He was no stranger to putting his body to the test to help viewers at home understand their own bodies.

Response to stress starts in the hypothalamus, the brain's command center. Once the hypothalamus decides on a course of action, it activates the sympathetic nervous system. It's a bit like the body's accelerator pedal, revving up your internal engines to prepare for action.

The signal from your brain travels to the [adrenal glands](#), located just above your kidneys. These glands release adrenaline, a hormone many of us are familiar with. Adrenaline is responsible for many of the physical changes you experience during stress, such as increased [heart rate](#) and rapid breathing.

As adrenaline floods your system, your body gears up for fight or flight. Blood flow increases, delivering more oxygen and energy to your muscles and brain. This prepares you to either confront the threat or make a quick escape.

If the threat passes and the situation changes, your body needs to slow down and return to a state of calm. This is where the parasympathetic nervous system comes into play. Acting like a brake pedal, it slows your breathing, heart rate, sweating, metabolism and [blood flow](#), helping us relax and recover.

The fight-or-flight response happens within milliseconds. But when you

need to stay on high alert for an extended period, your body relies on a different system to keep us in overdrive. This system is known as the HPA axis, which involves the hypothalamus (H) and pituitary (P) in the brain, along with the adrenal (A) glands above the kidneys. Together, the HPA axis eventually produces cortisol, commonly referred to as the stress hormone.

To help viewers visualize what was happening inside his body, we monitored Michael's heart rate using a chest strap and a smartwatch. This is a [reliable indicator](#) of the immediate fight-or-flight response, driven by the [sympathetic nervous system](#) and the release of adrenaline.

We also measured his [cortisol levels](#), a marker of the body's longer-lasting stress response, through saliva samples, reflecting the activity of the HPA axis. And to gain deeper insights into Michael's experience, a sports psychologist from our team interviewed and supported him before, during and after the stressful situation.

But knowing what we know about the body's response, how can we use that to help us manage stressful situations? Here's the advice we gave Michael.

1. Know your body

When your heart starts racing, your breath quickens and you begin to sweat, it's all part of your body's fight-or-flight response. While these sensations can feel unsettling, they're actually your body's natural way of preparing you for action.

These responses are crucial. They prime your muscles for physical activity and sharpen your brain for optimal performance. By recognizing these changes as normal and beneficial, you can reduce the anxiety that often accompanies them.

A useful strategy is to write down the physical reactions you experience during stress. Before facing a potentially stressful situation, review this list. Remind yourself that these responses are your body's way of helping you perform at your best.

2. Practice makes perfect

The fight-or-flight response varies from person to person and also depends on the circumstances. While one person may experience intense stress in a given situation, another may hardly react at all.

This difference often comes down to experience, self-confidence and the coping mechanisms we use. The good news is that you can train your body and mind to handle stress more effectively with practice.

For example, if you're preparing for an exam, try taking a mock test in a similar environment beforehand. If you have a presentation at work, rehearse it in front of friends or family first.

You can also benefit from [psychological skills training](#), such as visualizing success, or using relaxation techniques before stressful events.

3. Be kind to yourself

Although the fight or flight response is generally considered helpful and healthy, the response can be harmful if prolonged over time. Yet many of us will experience such protracted periods of stress in our lives, be it at work, school or in a personal situation. These can result in elevated cortisol levels. Over time, this can increase the risk of cardiovascular disease and mental health issues like anxiety.

To keep your stress response in check, it's useful to use strategies that help prevent it from spiraling out of control. These can include using [mindfulness](#) techniques, taking part in [physical activities](#) and eating a [healthy diet](#).

4. Seek support

Research shows that [having support](#) from peers, family and mentors can reduce the body's physiological responses to stress. Whether you're seeking advice for a specific upcoming challenge or simply building a strong support network, the presence of others can help lower your adrenaline and [cortisol levels](#) during stressful situations. Surrounding yourself with supportive people is a powerful way to manage and mitigate stress.

The potential of understanding and managing the fight or flight response is huge. As we show in the program, it could enable athletes to perform under pressure, students to better prepare for exams and employees to handle workplace stress more effectively.

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