

## Stress: How long-term pressure can kill

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In only the past two months, significant new studies have shown the influence of stress on heart attack and stroke deaths, weight gain and tooth problems. Recent research also links long-term anxiety with health problems ranging from acne and brittle nails to hair loss, diabetes and cancer.

The paradox is that, when brief, the stress response can save your life. However, when anxiety is prolonged and consistent, good stress turns bad.

The key lies in the two triangular adrenal glands, one sitting on top of each kidney. When we feel threatened, these release the stress hormones adrenalin and (most significantly) cortisol, which switch off all the body's long-term repair projects in favour of short-term measures to help you to deal with the crisis. They are the "worry about the consequences later" hormones, increasing our heart rate and blood glucose levels to give us energy, but dampening down our digestion, ability to rest and immune response.

When the threat goes away, these levels should dip again, so that we experience the effects for only up to an hour. The problem, says Professor Stafford Lightman, professor of medicine at Bristol University's stress research centre, is that many modern stress triggers, from redundancies to divorce proceedings, are continuous. "If cortisol is at high levels continuously over, say, a 24-hour period, the bodily responses that it provokes start to cause damage," he says.

#### **Blood pressure**

Cortisol adjusts the way genes express themselves. The genes that control the narrowing of blood vessels, for example, are dependent on cortisol — so continuously high levels keep those genes turned on, and blood vessels stay narrowed. That, in turn, raises blood pressure, which can lead to heart attack and stroke. A new study in the *European Heart Journal* shows that stressed, gloomy people are 22 per cent more likely to have heart disease than more resilient people.

#### **Brain function**

Stress reduces your reasoning power and impairs memory. Experiments with rats indicate that long-term exposure to cortisol causes brain cells to fire too frequently, causing premature death.

Research indicates that it may play a part — with poor diet and lack of physical activity — in the development of type 2 diabetes. These conditions revolve around the inability of the body to regulate blood sugar levels, which cortisol is known to influence.

## **Depression**

People with severe depression have sustained high levels of cortisol, which, in turn, reduces the effect of chemicals called neurotransmitters that help brain cells to communicate.

## **Teeth grinding**

A new study from Heinrich Heine University in Germany indicates that night-time tooth-grinding is most common in people who are experiencing stress. Edinburgh dentists have reported a 20 per cent increase in teeth grinding since the beginning of the recession.

## **Obesity**

The link between being stressed and putting on weight has been hotly debated, but recent American research indicates that continually raised cortisol levels can result in obesity, particularly in girls and those who are depressed.

## **Hair loss**

If your body is stressed, growing hair or nails is not high on its priority list. Chronic stress is a major risk factor for alopecia — bald spots in your hair or beard.

## **Fertility**

Stress hormones inhibit gonadotropin, the sex hormone, suppressing ovulation, sperm production and sexual activity.

## **Colds, flu and infections**

The continuous presence of cortisol in our bloodstream reduces our ability to fight viruses and bacteria. The longer-lasting the stress, the weaker the immune system.

## **Cancer**

Recent research indicates that because long-term stress weakens the immune system, it may influence whether you develop cancers that are triggered by viruses — for example, cervical cancer and some liver cancers and lymphomas.

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