

## Can you die of a broken heart?

With science presenter, **Greg Foot** and **Dr Hannah Fry**

**GREG FOOT:** Using FMRI, researchers looked at the changes in blood flow to different parts of some loved up brains. As their owners looked at pictures of their new squeezes, their brains were flooded with the neurotransmitter dopamine and the areas that lit up were those associated with reward and motivation.

**DR HANNAH FRY:** So in other words romantic love is all about the motivation to get someone and to keep them.

**GREG FOOT:** Yes pretty much, and here's a cool thing – you get the same dopamine hit and brain pattern when you become hooked on the likes of nicotine and cocaine. So when you're in those first throws of passion you are literally addicted to love.

But the connections between addiction and love also explains what happens to your body when you get dumped. It was like they were still in love addicted to the other person and the pain was coming because they weren't getting their fix.

They found that someone looking at a photo of their ex and reliving that feeling of rejection, had similar patterns of brain activity to someone touching a hot probe. So your brain reacts the same to rejection as it does to physical pain.

**DR HANNAH FRY:** So heartbreak does actually hurt. But it gets even more serious than that.

We've all heard those stories of an elderly couple who have lived together for years, and both die of natural causes within a few days or weeks of each other. Ok, how can two people's death of natural causes possibly be connected? But the statistics suggest they are and that bereavement does do something to your body and in fact your chances of dying increase by up to 30% after being bereaved. It takes two full years for that increase in mortality to return to normal. There's also evidence that a key component of your immune defences is directly weakened in a period after grief.

**GREG FOOT:** Now this is a condition known as **Tako-tsubo Cardiomyopathy** or **Broken Heart Syndrome**. It's a condition where your heart muscles suddenly become stunned and actually changes shape. Research suggests that over 85% of cases start after a physically or emotionally stressful event which is normally the likes of a bereavement. But it can also be the shock of intense, unexpected happiness such as winning the lottery! The most likely explanation is that the heart is stunned by an abnormal response to a sudden release of adrenalin and other stressfulness.

**DR HANNAH FRY:** Adrenalin is normally related to fight or flight – so a surge of strength almost. But adrenalin here is a cause of weakness.

**GREG FOOT:** So yes, it is possible to die of a broken heart.

**DR HANNAH FRY:** And the data supports it.

**GREG FOOT:** Bonus fact about the shape that the heart makes; it has a ballooned out left ventricle which looks just like a Japanese octopus pot called a Tako-tsubo. Hence the name Tako-tsubo Cardiomyopathy.