

## **Depressions - Potential Underlying Causes.**

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We all have periods where we feel low and unhappy. However, in some cases this low feeling becomes overwhelming and takes over our lives to a degree that it becomes debilitating, as metaphorically described by dementors in J. K. Rowling's Harry Potter books.

The question is why does this happen and what can be done about it. As the animals we are, there are certain actions we have to do; we have to breathe, drink, eat and have sex, the latter for the long-term survival of our species. Breathing is more or less a constant action, and there is no pleasure associated with it; it is an "automatic" response to low oxygen and "high" carbon-dioxide levels. Thirst is a bit similar; we have to drink water regularly or we will die; and the feeling of thirst can be overwhelming, but again drinking water is not associated with pleasure but more like a feeling of relief. However, eating and sex is different. We have to be selective in what we eat; not all plants/fruit are edible, indeed many are not, and with meat and fish it has to be "fresh" to in order to be safe for us to consume. With regard to sex we have to be even more selective in order to find a good partner to raise children with, but importantly sex is also associated with an even greater feeling of pleasure.

When it comes to food, we are programmed through our taste buds and sense of smell to select food that is safe and nutritious for us, and furthermore, there is an award response associated with eating. We eat not only because we are hungry, but also because it makes us feel good, indeed feeling hungry is often associated with bad moods. Eating makes us relax and feel happy; we all know comfort eating; or meeting with friends for a meal. Similarly, when we are depressed, we tend to have a reduced appetite both for food and sex. Here it is important to note, that food and sex are not the only sources of pleasure; many other stimuli of the right sorts make us feel good and

happy; smells, sounds, views, physical and social contact, thoughts, as well as exercise (other stimuli have other effects; inducing responses such as fear, anger, stress, pain and so on). All these "good" stimuli are transferred through neurons to our brain, where the neural signals act to release of pleasure hormones such as dopamine from other neurons. Importantly, when people are depressed it is most likely not because the neurons in the brain stop producing dopamine (or other hormones) but because the neurons are not stimulated to release the hormone(s). One piece of evidence for this is the success of cognitive behavioral therapy (different thoughts stimulates different neurons), but also sex where there from dedicated neurons is released a burst of hormones (synthesized beforehand within the cells and stored in vesicles close to the cell membranes) during orgasm within a short timeframe. Similarly, when we have eaten for a while, the pleasure associated with eating decreases (stored hormones have all been released), and when we are very hungry due to not have eaten for a while, the food taste better (more hormones stored and present to be released).

Most likely, in order for us to feel happy and well, there has to be a semi-constant synthesis and release of pleasure hormones, caused by the different stimuli. Here, each stimuli release adds up to the sum and the stimuli are somewhat interchangeable, although, the pleasure stimuli of eating well might be the cornerstone for our emotional wellbeing as eating is so central for our survival.

In conclusion, in addition to the successful treatments using anti-depressants, and cognitive behavioral therapy, making patients aware of the different stimuli that makes them feel emotionally better, and the importance of pursuing as many of them as possible, as they add up, might indeed be beneficial for all types of depressions.