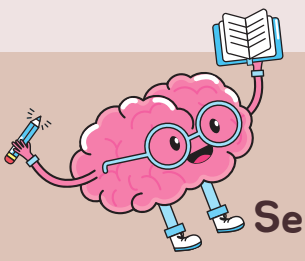
The Neuroscience Of Eating Disorders

The basics

Neuroplasticity

The brain is considered to be plastic, meaning that with the right conditions, the brain can re-wire itself, it has the ability to adapt and change through learning. As the saying goes, the neurons that fire together, wire together. New pathways are formed as a result of experience. Unlearning occurs through less freqeunt activation of certain neural pathways.



Neurotransmitters

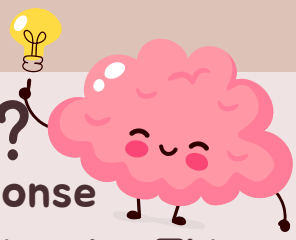
Serotonin (S) and Dopamine (D) are the two most commonly implicated neurotransmitters in EDs due to their role in regulating eating behaviour, hunger, memory, reward and pleasure. When serotonin levels are not too high/ low, one feels 'good', regulated, calmer, & more stable. When Dopamine levels are not too high/low, one experiences pleasure and feels motivated.

What the data shows

So far, research has shown that individuals with Anorexia Nervosa experience lower levels of S when underweight and higher levels in recovery. With re-feeding this leads to a spike in anxiety and greater perfectionism, harm avoidance and ability to go without pleasure. Restriction and less food become MORE rewarding, feel better and decrease low mood. Dopamine issues have been implicated with the onset of AN. Increase in dopamine does not result in greater pleasure or motivation, in fact, it is the amygdala (fear and anxiety) that are triggered in relation to food.

What about BN and BED?

Research has shown that in clients with Bulimia Nervosa, drops in S are experienced following restriction, leading to binge eating and irritability. Generally, lower levels of D are experienced, which increase with binge eating. For Binge Eating Disorder, lower levels of both S and D have been implicated, however, with a greater hyper-responsivess to food (food is far more pleasurable and rewarding).



What does this mean?

Clients with AN experience greater anxiety and fear in response to food and with the process of re-feeding/ increasing food intake. This makes recovery and eating more challenging. Clients with BN and BED experience a desensitisation of dopamine circuits, leading to cravings and binge eating, experienced as rewarding and pleasurable.

How can this be useful?

Information regarding the way in which the brain works and functions and how the brain is impacted by eating disorders can help sufferers and their loved ones understand the impact, reduce blame and set up more realistic expectations about what the client can do/ what to expect in treatment.