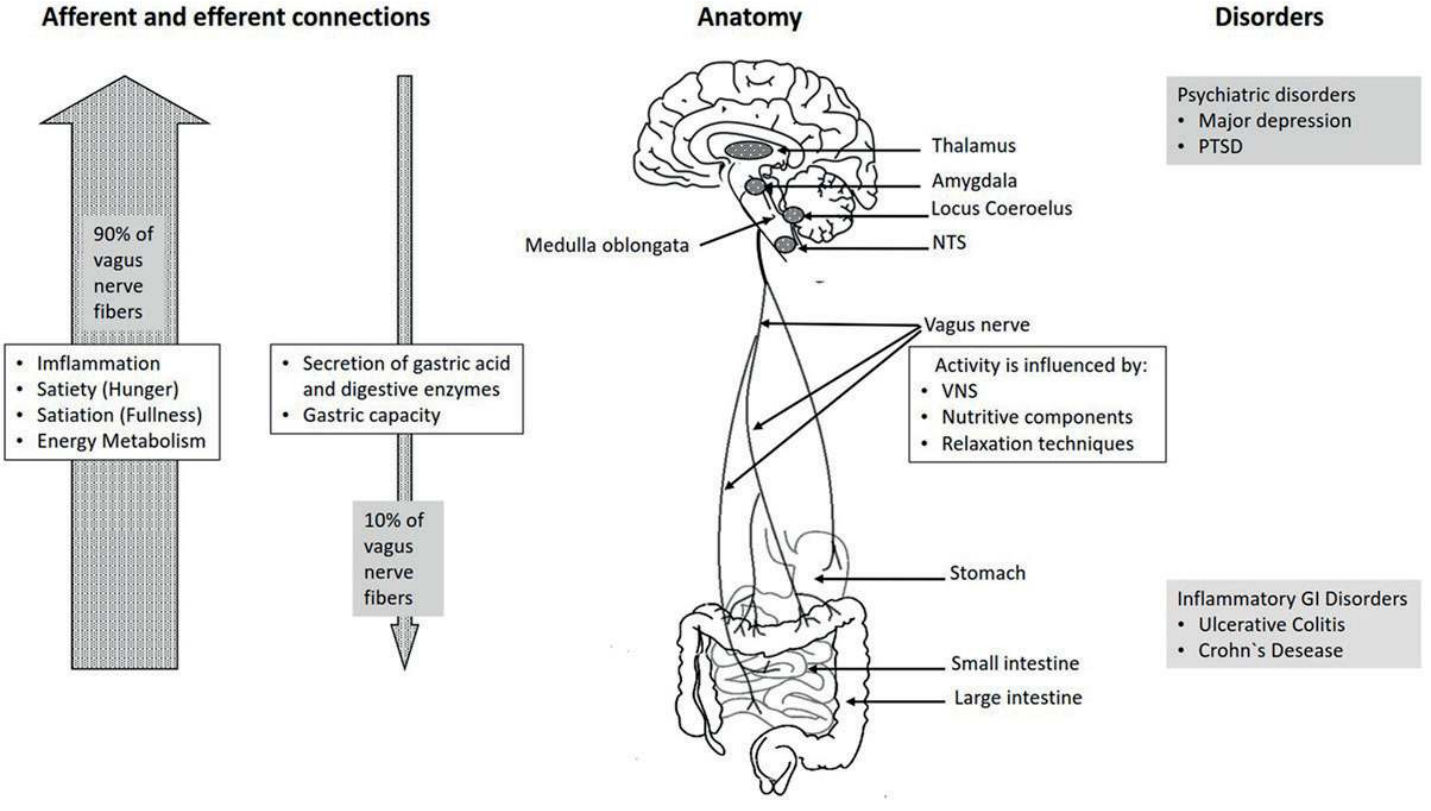
An illustration showing some of the anatomy and functions of the vagus nerve[ii]

In the middle: **an illustration of the anatomy of the vagus nerve and how it is influenced**

On the right: **psychiatric disorders influenced by vagal activation**



The vagus and parasympathetic function

The vagus is the main contributor to the parasympathetic nervous system, with the most important function being afferent; transmitting information from the organs, gut, heart and lungs etc. to the brain.

We instinctively know this; as we have all witnessed how our own body physiology reacts when we find ourselves in a very stressful situation, or when we are scared of an up-coming event. Even just recalling a difficult time in our lives may create symptoms. These symptoms may include a racing heart, shallow breath, high voice or even a disrupted digestive system (all of these tissues and organs have vagal innervation). There are many phases in the English language that refer to these type of fearful body sensations; "my heart missed a beat", "my stomach was in my mouth", "I had butterflies", "my stomach was in knots", "I could not catch my breath". These felt sensations are in fact due to physiological responses in the viscera that are transmitted back to the brain for interpretation -conveying what could be called "gut feelings" or "instincts" to the brain.

A fascinating new study, entitled, "Gut Vagal Afferents Differentially Modulate Innate Anxiety and Learned Fear"[i] shows research from ETH Zurich which has identified how "gut instincts" reach the brain via the Vagus Nerve and are linked to different fear and anxiety responses.

The vagus nerve is a two way highway, known as the "brain-gut axis". Efferent nerves send messages out from the brain to the viscera and peripheral body, whist afferent nerves send messages from the periphery back to the brain. Up to 90 % of the nerve fibres in the vagus nerve are afferent, dedicated to communicating the state of your viscera -through emotion and gut instincts - back to the brain for interpretation. Therefore, disruption in vagal activity plays a role in major psychiatric conditions, such as regulating mood, as well as fear and anxiety states and PTSD. Increased vagal activation, will be interpreted by the brain as bad; causing us anxiety, keeping us in an alert state or stimulating the fight or flight response.

Feedback loop

With this mind-body feedback loop, messages are transmitted downstream from your brain and conscious mind via efferent branches of the vagus nerve, as well as up-stream.