Module 4, Lesson 3 Handout:

The Vagus Nerve

The vagus nerve is made up of an intricate neural network that connects the brain to the digestive system and other organs in the body. It starts at the medulla of the brainstem, and travels down the neck past the thorax and the abdomen, then to the digestive organs including the stomach and small and large intestine. All along this path, it branches out to connect to different muscles and nerves. Not surprisingly, the vagus nerve is a critical component of the parasympathetic nervous system and plays a huge role in communication throughout the body, regulating many muscular functions and sensations.

The Vagus Nerve & Gut Health

The brain and gut communicate through many different pathways, all of which make up the hot topic you learned about in this lesson - the gut-brain axis. Researchers are studying this to further uncover the relationship between gut health and brain health, and the vagus nerve plays a major role in this. Basically, the vagus nerve senses microbiota signals and sends this information to the central nervous system.

Here's a summary of how it works: When the vagus nerve is stimulated, it activates M2 macrophages and deactivates M1 macrophages. M2 macrophages are anti-inflammatory and produce tissue-repairing factors that aid in gastrointestinal infection and inflammation. M1 macrophages are pro-inflammatory and studies have shown the ability of the vagus nerve to inhibit these M1 macrophages may play a role in modifying intestinal permeability and gut microbiota.

It's known that people who have Crohn's disease and IBS have decreased vagus nerve tone and function. Stress is a big factor in Crohn's and IBS, and stress is also associated with leaky gut and dysbiosis. When the body is stressed, signals are sent through the vagus nerve causing gastrointestinal issues such as increased intestinal permeability and changes to the gut microbiota. The vagus nerve is inhibited by this stress and not able to exert anti-inflammatory mechanisms to minimize gastrointestinal damage and inflammation.

Putting it into Practice

Work with your clients to reduce stress to help repair gut damage and reverse the response of the vagus nerve, which will help improve communication between the gut and the brain. Encourage

clients to eat foods that provide probiotics and contribute to the growth of good gut bacteria. These bacteria strains are outlined in a handout attached to this lesson. Helping your clients Stress Less and Eat Empowered will give them more control over their gut health and mental health, while repairing the communication of the gut-brain axis.