

MODULE 3:

Stress, Neurotransmitters & the Immune System

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Stress, The Nervous System & the Vagus Nerve

We all know the word stress and how it feels in our body. It is a known fact that stress is at the root of many undesirable physical outcomes, such as inflammation, aging, reduced immunity, decrease in digestion function, altered hormones, sleep disturbances and a change in neurotransmitters. Any of these could be at the root of auto-immunity, cancers or neurological diseases and so we find ourselves paying closer attention to our stress levels.

In Chinese medicine, when someone is experiencing a lot of stress or trauma we treat the heart first and foremost. Often stress manifests as digestive issues, sleep disorders and pain to name a few, and so we treat the heart as well as the other affected body systems. There are different kinds of stress from situational or lifestyle to internal or physiological. Mostly we can control our situational stress by choosing a lifestyle that supports our bodies functions. We often need to devote time and energy to understanding ways to reduce the stress we feel in our lives.

Physiological stress is the stress the body experiences as a product of just living and metabolizing. We can reduce some of this stress by choosing a diet rich in whole foods and dense nutrition, along with a balance of work, play, rest, healing modalities and movement.

We cannot mention stress without mentioning the nervous system. There are two main modes of the nervous system in the body, known as sympathetic and parasympathetic nervous system response. When we are in stress we are in the sympathetic nervous system response, well known as the fight/flight mode. In this phase the predominant chemicals in the body are creating more inflammation and reducing our bodies sense of well-being by heightening our senses and feeling as though we are in danger. These neurotransmitters and hormones such as cortisol and adrenaline are inflammatory and decrease digestion because the body is preparing to save itself. Long term effects of chronic sympathetic nervous system state reduces immunity and increases the likelihood of inflammatory diseases, chronic debilitating diseases and colds and flus. (1)

The parasympathetic nervous system response is known as the rest, digest, and repair state of being. During the parasympathetic nervous system response we have the chemical reality that

supports reducing inflammation, suppresses harmful chemicals such as tumor necrosis factor and stimulating the release of feel good neurotransmitters. (2) We are able to have our digestive juices stimulated and able to fully break down and assimilate our food. We feel at peace and at ease, able to breathe deeply and fully and notice what is going well around us. To get into the parasympathetic state we can be mindful, breath full and deep breaths, use visualizations and even touch our lips softly. (5) Other activities to get into parasympathetic mode include (but not limited to):

- Spending time in nature (watch a campfire)
- Get Acupuncture or Bodywork
- Practice meditation
- Walk barefoot on the dewy grass in the morning
- Jump into cold water, alternate hot/cold in the shower
- Splash face with cold water
- Deep abdominal breathing from the diaphragm or practice Wim Hof Method
- Repetitive prayer
- Focus on a word that is soothing such as calm or peace
- Play with animals or children
- Practice yoga, qi gong, or tai chi
- Exercise
- Essential oils
- Various relaxation techniques
- Morning pages, journaling technique invented by Julia Cameron
- Do something you enjoy, such as a favorite hobby
- Wear blue light blocking glasses when using technology

The Vagus nerve or cranial nerve X (CN X) is the longest nerve in the body and connects the brain to the lungs, heart, stomach and intestines and in turn regulates breathing, heart rate, digestion and also our mental health. It also stimulates digestive enzymes, promotes gut motility and repair of intestinal lining and is the main nerve of the parasympathetic nervous system. Parasympathetic nervous system regulates resting and digesting along with cellular repair, restoring, receiving and rejuvenating the body. It is a good thing to stimulate the vagus nerve to strengthen it. (3) Stronger vagal tone includes:

1. Faster recovery time from stressors
2. Increased immune function by reducing inflammatory molecules
3. Stimulating gut motility
4. Emotional regulation
5. Greater heart rate variability measure

The quicker we recover chemically from stress the better our health overall. When we experience stressors our body creates inflammatory molecules and compounds that in turn

continue to create inflammation and more stress. This can create a feedback loop where one stress leads to the next and so on. This is where Acupuncture and practicing other techniques to stimulate the parasympathetic response works with the nervous system to begin to “practice” a different nervous system response, in essence we disrupt the pattern. We need to practice interrupting the patterns of stress often or on a regular basis.

As discussed in module 2, our digestion and gut health plays a key role in our wellbeing and pro-inflammatory chemicals, so when the vagus nerve stimulates gut motility and in turn stimulates intestinal cellular repair, the overall gut health improves and so does our overall immunity and health. The gut microbes are responsible for making substantial quantities of neurotransmitters such as GABA, dopamine, serotonin, norepinephrine, histamine, and acetylcholine. (1) Wellness is indeed a product of overall health, we have to pay attention to all the bodies functions to find utmost balance. Here is another example of how wellness revolves around the center or the Earth element in CM, the digestive organs of the Spleen and Stomach. In the fall season it is important that we pay attention to our nourishment/digestion /earth to ensure a healthy fall and winter season.

Another marker of health is heart rate variability (HRV). It is the heart rate’s response to respiration; we want the heart rate to fluctuate more drastically with inhalation and exhalation, known as a higher HRV. This improves the recovery time from stress to a relaxed state when we have a higher HRV and overall, a slower resting heart rate. Studies show a positive effect with Acupuncture and HRV and reducing the LF/HF ratio, which shows an increase in parasympathetic response and vagus nerve stimulation with Acupuncture. This is evidence that acupuncture has an actual effect on the nervous system (4).

Finally, it is important to acknowledge trauma in terms of stress and our sense wellbeing. There is acute, chronic and complex traumas and it is of utmost importance that we strive to resolve them in a timely manner. Trauma may trap the body in the sympathetic response and this paper has begun to show the detrimental effects of staying in this chemical reality for too long. This may be no easy task, and in no ways does this suggest that it will be easy, but finding support along this journey will allow for you to harness your inner resources and guidance system to heal from any kind of trauma. Acupuncture and Chinese medicine is well-equipped with helping people heal from many kinds of traumas. If you are experiencing trauma, please reach out to a helper as soon as you can and take those first steps towards resourcing yourself.

Neurotransmitters

What is all this talk of neurotransmitters? What are they anyway?

Neurotransmitters are often referred to as chemicals of communication from neuron to neuron or neuron to muscle or gland. We might also see them as messengers and networkers but also as a liaison between the physical body and the mental-emotional body. This includes the energetics of the Triple Warmer (TW) organ in Chinese medicine. The TW is a formless fire organ related to connecting the three warmer areas of the body with one another and sharing the resources from each with one another through the water pathways and the pathways of the nervous system. The three burners are the upper burner of the chest with the lungs and heart, middle burner of the digestive organs and the lower burner housing the kidneys and sex organs.

Neurotransmitters also prove that we have a direct path from our gut to our brain. This gut-brain axis can serve as a diagnostic tool for practitioners to understand where and how to treat for a multitude of symptoms, from anxiety, depression, digestive complaints, sleep issues, pain and so on. We can use the TW channel to carry these messages to and from the body parts, like the neurotransmitters communicate to the brain and body tissues.

Some basics on neurotransmitters:

They help to regulate many body functions including:

- Breathing
- Mood
- Appetite
- Heart rate
- Digestion
- Sleep cycles
- Memory
- Muscle movements
- And more!...(medical news today)

We are familiar with some of the neurotransmitters by name, such as dopamine, serotonin, GABA and oxytocin for instance. Each one stimulates a different center in the brain, but overall these are the “feel good chemicals” we are all looking for, sometimes in the wrong places. Social media is well known to be playing on our emotions by giving the body dopamine hits with the way the algorithms are created...and then we can become addicted to these good feelings. Serotonin, for instance, is known for its role in depression, but it has since been noted for its role in the immune system. It is shown that irritable bowel and depression are often hand in hand. It is noted that there are high inflammatory markers that then suppress the production of serotonin by depleting its precursor molecules. (2)

There are many positive ways to boost these “feel good chemicals” see the chart below:



We can also show that there is a direct connection between Neurotransmitters and the Immune system. T-cells (immune system cells) synthesize acetylcholine, and this helps us with learning and memory for instance. Acetylcholine also suppresses tumor necrosis factor and reduces inflammation which in turn supports the immune system. (6) This constant communication between the immune system, the brain and the gut can all be linked to the neurotransmitters, showing that it is imperative to have a whole body approach to wellness, and it could always be worth starting with healing the gut and digestive health when looking to heal. In essence it comes down to diet and a balanced lifestyle, finding support and resources that boost vitality and ability to persevere through any health challenge.

Qigong

One of my favorite “feel good” activities is qigong. I am a long time dancer, have done yoga and pilates and once I discovered qigong I felt that it offered the missing pieces from my other wellness body practices. It is easy, low-impact and creates lasting effects on the body. The system we will practice is from the Jin Jing Gong Qigong lineage, taught at NUNM.

Jin Jing gong qigong is designed to strengthen the tendons, ligaments and connective tissue to

prevent disease, along with increasing the practitioners' awareness of their body and surroundings. It opens the meridians and smoothes the energy flow to allow the body to detoxify and release stuck and held emotions and patterns that are hindering wellness. This is accomplished through a combination of sounds, sitting and standing meditations, mudras, mantras, movements and posture practices. During this class I will lead participants in a movement practice that can be followed to bring about a sense of balance and ease.

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