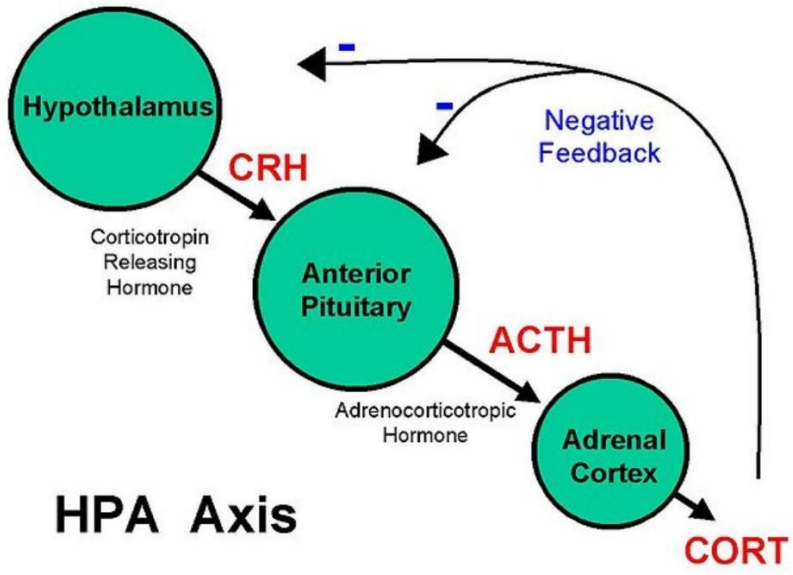
Can STRESS Make You SICK?

The Effects of Stress on your Immune System

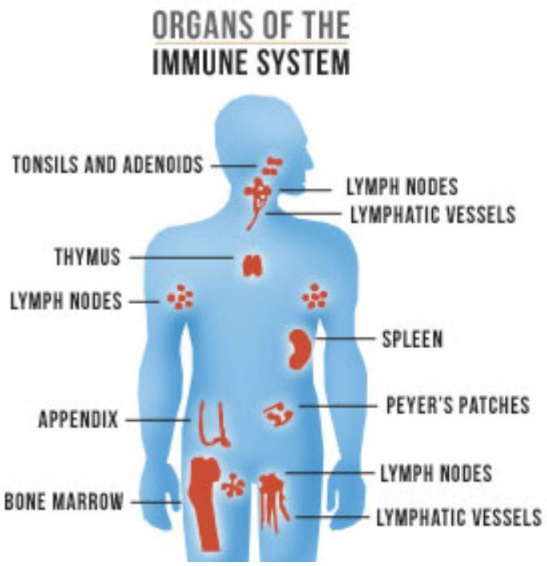
Do you have stress during these unusual times? I think we would all agree with an astounding answer… YES!! These current circumstances do present additional challenges or intensify prior ones. Financial, personal relationships, work environment, employment, health issues, digesting the news, fear/uncertainty of the future etc. We certainly can easily add to this list. This continual bombardment of thoughts and images can have a profound effect on our immune system. Let us find out how stress can affect our immunity and what can be done to help.



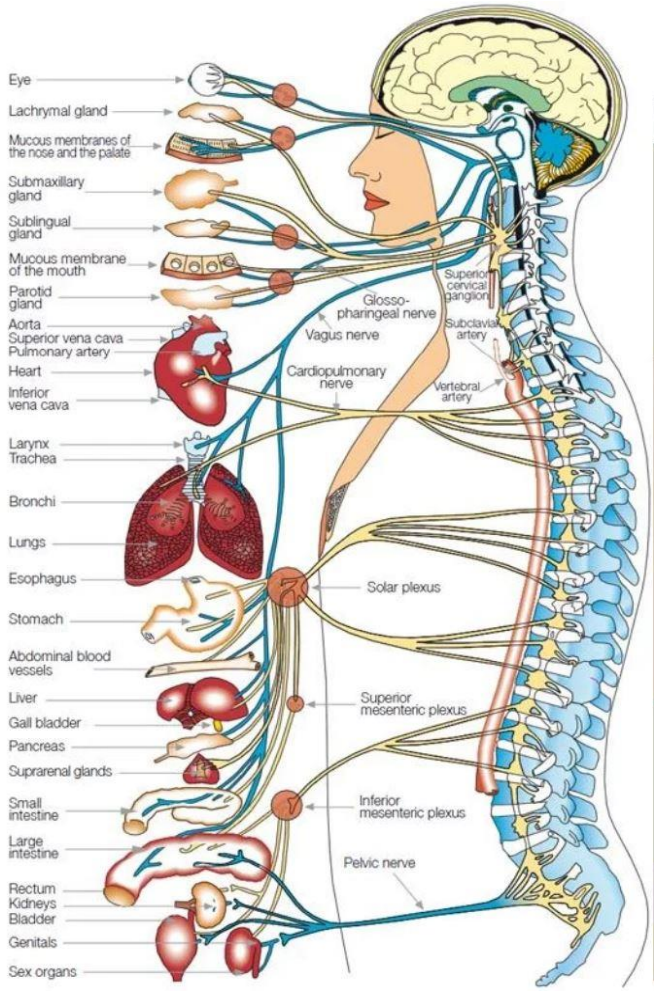
The diagram above outlines one of the ways that mental/emotional stress can influence the release of our stress hormones by a gland called the **adrenals**. A portion of the adrenal glands called the cortex will release **cortisol**. This process starts with the parts of the brain, the **cerebrum**, where we have conscious thoughts and an area of the brain called the **limbic system**. The limbic system would be considered the **emotional/feeling portions of our brain**. The combination of information from the cerebrum and limbic system has an important and significant input into the hypothalamus. The **hypothalamus**, another part of the brain, then signals the **pituitary gland**, also known as the master gland, to release hormones to stimulate the **adrenal glands**. This connection of brain and body is referred to as the **HPA axis** (hypothalamus-pituitary-adrenals).

Another way that **mental/emotional stress** can affect the body initial starts again in the cerebrum and limbic system. It once again influences the hypothalamus but this time there are **nerve pathways** that go to the brain stem or medulla oblongata. In the **brain stem/medulla** it

makes connections to the part of the nervous system called the **autonomic nervous system**. The autonomic nervous system is made up of the **sympathetic** and **parasympathetic** nerves. We could simply think of the **sympathetic** as the **accelerator** pedal and the **parasympathetic** as the **brake** pedal in your car. Most of these nerves run down your spinal cord from the brain exit the spine and travel through the body to various organs and glands. **Just as a side note, from a chiropractic standpoint these nerves can potentially be affected with spinal misalignments**. **Spinal misalignments also give feedback to brain stem and spinal cord**. It is important to know that these sympathetic nerves will stimulate a portion of the adrenal glands called the adrenal medulla. In the **adrenal medulla** two other "stress" hormones are released called **adrenaline** (epinephrine) and **noradrenaline** (norepinephrine). Furthermore, these **autonomic nerves** can have **direct influence on many immune related organs**. Here are some illustrations of the second "stress" pathway and immune organs/glands that are influenced by autonomic nervous system.



Please note: that many of the main sympathetic and parasympathetic nerve branches listed below go to these immune glands/organs.



VERTEBRAE	AREAS AND PARTS OF THE BODY	POSSIBLE SYMPTOMS
CERVICAL		
C 1	• Back of the head	Headaches (including migraines, aches or pain at the back of the head, behind the eyes or in the temples, tension across the forehead, throbbing or pulsating discomfort at the top or back of head)
C 2	• Various areas of the head	
C 3	• Side and front of the neck	
C 4	• Upper back of the neck	Jaw muscle, or joint aches or pains
C 5	• Middle of neck and upper part of arms	
C 6	• Lower part of neck, arms and elbows	Dizziness, nervousness, vertigo
C 7	• Lower part of arms, shoulders	Soreness, tension and tightness felt in back of neck and throat area
DORSAL		
D 1	• Hands, wrists, fingers, thyroid	Pain, soreness, and restriction in the shoulder area
D 2	• Heart, its valves and coronary arteries	Bursitis, tendonitis
D 3	• Lungs, bronchial tubes, pleura, chest	Pain and soreness in arms, hands, elbows and /or fingers
D 4	• Gall bladder, common duct	
D 5	• Liver, solar plexus	Chest pains, tightness or constriction, asthma, difficulty breathing
D 6	• Stomach, mid-back area	Middle or lower mid-back pain, discomfort and soreness
D 7	• Pancreas, duodenum	Various and numerous symptoms from trouble or malfunctioning of:
D 8	• Spleen, lower mid-back	– Thyroid
D 9	• Adrenal glands	– Heart
D 10	• Kidneys	– Lungs
D 11	• Ureters	– Gall bladder
D 12	• Small intestine, upper/lower back	– Liver – Stomach – Pancreas – Spleen – Adrenal glands – Kidneys
LUMBAR		– Small and large intestines – Sex organs – Uterus – Bladder – Prostate glands
L 1	• Ilocecal valve, large intestine	
L 2	• Appendix, abdomen, upper leg	
L 3	• Sex organs, uterus, bladder, knees	Low back pain, aches and soreness
L 4	• Prostate gland, lower back	Trouble walking
L 5	• Sciatic nerve, lower legs, ankles, feet	Leg, knee, ankle and foot soreness and pain
SACRO	• Hip bones, buttocks	Sciatica, pain or soreness in the hip and buttocks
COXIS	• Rectum, anus	Rectal trouble

Note: Green nerves – parasympathetic / Yellow nerves – sympathetic

What are some of the things stress does to the immune system?

At first the release of stress hormones can be helpful for the immune system and help reduce inflammation. However, when the stress response continues the chronic release of the stress hormones and nervous system stimulation impairs the immune system. **Here are some of the results of chronic stress**:

- Diminished ability of immune cells to fight infection

- Decreased ability of immune cells to proliferate and migrate to areas of infection or inflammation
- Decreased overall production of immune cells
- Increased levels of inflammation and increased inflammatory cytokines
- Reactivation of latent viral infections, an example would be shingles breakout.
- Decreased antibody production
- Impaired response to vaccinations
- Increased allergic sensitivity with certain levels of stress

What can be done to reduce the effects of stress ?

One of the ways to counter this is by utilizing different **herbal remedies** that can assist balancing the nervous system at the level of the **brain and the organs involved with the stress response**, particularly the **adrenal glands**. This group of herbals are often called **adaptogens**. This group of herbals have the unique ability to balance function and often a few may have to be taken together to obtain adequate response. There is not one **combination** that is better versus the other because everyone has a different biochemical response to stress. Therefore, **being tested is the best way to approach this issue**. You may contact my office to be tested.

Here are some **Adaptogens to consider**:

- Ashwagandha
- Astragalus
- Cordyceps mushroom
- Eleuthero (Siberian ginseng)
- Holy basil extract (Tulsi)

- Licorice root- just be cautious if you have elevated blood pressure
- Maca
- Panax ginseng extract (Asian ginseng) is one of the more potent!
- Rhodiola rosea

Another compound that can **minimize the effects of stress on the brain** and may **improve sleep** is called **phosphatidylserine**. Having adequate levels of B vitamins, omega 3 fats are essential as well.

Another thing to consider with dealing with **stress** are the chemicals in the brain called **neurotransmitters**. There are several that influence the limbic system (emotional center) and are involved with the stress response. They are GABA (gamma-aminobutyric acid), glutamic acid/glutamate, dopamine, serotonin and NMDA (N-Methyl-D-aspartate). Potentially anything **creating imbalances** in these neurotransmitters can result in improper emotional/stress response. One of these imbalances may have to do with **improper gut/intestinal function** and **abnormal gut microflora** that can result in **inflammatory** change in the **different areas of the brain**. We will discuss some of these connections between the gut and brain in **future newsletters**.

Are there any other means of reducing the effects of stress?

There are many other things that can be done to reduce stress. We will briefly mention some of them below:

- Eating a healthy balanced diet, avoiding inflammatory foods, nourishing and balancing your gut microbiome
- Get plenty of sleep, go to sleep by 10pm.
- Regular moderate exercise
- Practicing relaxation techniques, deep breathing, getting massages, mindfulness techniques
- Fostering healthy relationships, getting social support

- Having a sense of humor
- Volunteer your time in your community, give to others
- Positive thinking and sense of thankfulness
- Learn to manage your time more effectively
- Make time for hobbies, interests and relaxation
- Be assertive about your feelings, opinions and beliefs instead of being angry, defensive or passive
- Accept that there are some things that we cannot control
- Have reasonable expectations
- Set limits and do not get overwhelmed or over committed

These are just some suggestions and certainly are not complete!

There are many factors that affect the immune system and chronic mental/emotional stress is an important and significant factor. **Next newsletter we will address the importance of the gut** and how it influences the brain, neurotransmitters and the immune system. Again, we are here to help balance your body and are actively taking appointments. Call for an appointment for better health at (480) 732-0911.

Best of Health,

Dr. James D. Reade