

Fibromyalgia, Chronic Fatigue, and Multiple Chemical Sensitivities – A Unified Hypothesis

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When they arrive in your office, they all look the same with minor variations, rather like identical suburban tract houses with different floor plans and exterior colors.

They have body pain that varies between a 4-5/10 and a 6-8/10. They don't sleep. They report being fatigued and depressed and say that walking down the soap aisle in the grocery store or standing next to someone who wears perfume gives them a headache or makes them sick for days. They seem to react to so many foods and are allergic to everything. Medications might reduce the pain a little and create side effects like fatigue and slow thinking, but it's all the doctor can do.

It doesn't matter how many doctors of what type they have seen, they get one or more of these diagnoses: fibromyalgia, chronic fatigue, multiple chemical sensitivities and recently they are often told they have mast cell activation syndrome (MCAS) or small intestine bacterial overgrowth (SIBO), gastroparesis, leaky gut, mold toxins, Epstein-Barr (EBV) or maybe Lyme (even though the Lyme tests have been negative or show only 1 band). Or they are told they really just have depression even though they are already on an antidepressant and they are prescribed an additional antidepressant or a stronger dose of the one they are already on. Or, worse yet, they are put on a "mood stabilizer" that turns out to be an "atypical antipsychotic" with severe long-

term side effects we won't have time to cover in this article.

In general, no one asks them, "What happened immediately before the onset?" If the answer is, "Nothing happened, it just started," the doctor usually moves on to the next questions instead of drilling deeper. If the patient is lucky, the next question might be, "When was the last time you felt well?" And the answer is often, "I've always been sick. I think I've been like this since childhood." The next question should be but isn't usually, "What did you do for fun in grade school or high school?" That answer is often, "I played soccer, rode horses or did gymnastics or theater." Replies the doctor, "So up until that year you were fine. Then what? When exactly did the symptoms get this bad?" After that the answers might be relevant. But few doctors ask the set of questions that should come next.

My entire practice since 1998 has been the 10% of patients no one else could help, and I failed a number of them myself. But eventually through trial and error and being sick and recovering myself through the help of brilliant colleagues, I learned what I am about to tell you in this article.

In general, there is either the most basic medical blood work ordered, which will turn out normal or there may be up to \$3,000 to \$4,000 worth of exotic complex blood work ordered, which will show all sorts of items out of range. But the exotic blood work doesn't ever say how the analysis is done, where and on whom the normal levels were determined or published and gives very little guidance about what to do to correct the abnormal

results. Patients either leave with a prescription for something that might not help much or \$500-\$1,000 worth of supplements to take three to four times a day that might help in a few months after they have been on an incredibly restrictive diet.

If they look on the internet, they will be even more frightened and hopeless but will feel, at least, that there are many other people who have what they have so they know now that they are not crazy. And then they come to you, for one last chance, that you might be able to help.

If you're like most practitioners, you swallow the rising panic and desperation and apply the latest thing you read or the technique you've learned that helps most patients and hope it will help this patient.

If you're the patient, you hope that this person might be the one with a solution to this thing that has made your life miserable for the last two, five, 10, or 20 years. You hope that the little glimmer of hope you have will turn desperation into a solution that makes the trip and the office visit worthwhile as you tell the story for the tenth time to the tenth doctor.

And, the truth of the matter that gives rise to this unified theory, is that these conditions and these symptoms have one thing in common that no one thinks of because they don't have a way to treat that one thing. I propose that this thing they all have in common is the vagus nerve through its role of suppressing the immune system, regulating gut motility and gut pH and therefore gut bacterial flora, and the connection of the vagus to the brain and limbic system. Once

continued on page 56 ►

FMS, CFS, & MCS

►continued from page 54

you have a way to treat the vagus fairly quickly and you can see the results and improvement fairly quickly, then the connections begin to be obvious and the patients improve.

It should be said up front that I developed Frequency Specific Microcurrent™ (FSM) in 1996, and FSM is what I add to treat all of these patients as an adjunct to what most practitioners already do. It has to be said that I don't know how I would treat any of these conditions without FSM, so this article can only tell you the unified theory based on treatment experience; it won't teach you how to use FSM, but it might give you a reason to look into it. It is hoped that the theory will be interesting whether FSM appeals to you or not.

Fibromyalgia (FMS) is a neuroendocrine condition characterized by chronic full body pain in all four quadrants, chronic non-restorative sleep, and central pain sensitization lasting more than three months. Fibromyalgia patients have reduced levels of growth hormone due to reduced levels of growth hormone releasing hormone (GHRH) in the brain and loss of stage 4 sleep during which 85% of growth hormone is generated. Growth hormone in an adult facilitates transport of amino acids into muscle cells for repair. Fibromyalgia patients do not tolerate exercise because they don't have enough growth hormone and can't repair the normal wear and tear produced by even minor exercise. They have reduced levels of branch chain amino acids, and there are consistent hormone and neurotransmitter abnormalities across all fibromyalgia patients no matter what caused the fibromyalgia.

After treating over 500 fibromyalgia patients in 23 years, it has become obvious that there are at least five different and distinct causes of fibromyalgia. The literature says that 27% of cases are caused by physical trauma. Clinical experience puts that number at closer to 40%. The other causes are organic chemical exposure, severe prolonged stress, viral illness, and there is a genetic type characterized by genetic defects in the serotonin pathways that affect pain processing or

genetic defects in other neuroendocrine pathways. Fibromyalgia may start from any one or from a combination of these causes. Regardless of how they start out, fibromyalgia patients end up looking like the patient described in the first section of this article.

Chronic fatigue syndrome (CFS) is distinct from fibromyalgia although both diagnoses are sometimes used as a garbage-can diagnosis by many of the physicians who treat these patients. Chronic fatigue is associated with a positive Epstein-Barr titer and tender lymph nodes suggesting some infectious influence. Some researchers question whether EBV causes CFS or is opportunistic. There is some support for the idea that CFS is an advanced form or variant of fibromyalgia but that is not well accepted. In CFS, fatigue and cognitive problems are the overwhelming complaints, along with non-exudative pharyngitis, swollen cervical lymph nodes and low-grade fever. In one study substance P was not elevated in the spinal fluid of CFS patients whereas it is generally elevated in fibromyalgia patients.

Multiple chemical sensitivities (MCS) is a controversial diagnosis unless you are the patient who has it. The medical community is still trying to decide whether it is a clinical diagnosis or not. Many in the medical community consider MCS symptoms to be a physical manifestation of psychiatric illness rather than a primary medical illness. This attitude prevailed towards fibromyalgia for many years until there was finally enough research to demonstrate consistent physiological abnormalities among fibromyalgia patients. There are those in the medical community and patient advocate groups who agree that multiple chemical sensitivity is a negative physical reaction to certain chemicals. Which patients have which symptoms may depend on individual genetic variants in individual liver detoxification pathways and neurochemical and metabolic pathways. There is still debate as to whether multiple chemical sensitivity can be a diagnostic illness on its own.

The most common symptoms of multiple chemical sensitivity may include headaches, rashes, asthma, muscle and joint aches, body pain, fatigue, memory

loss, and confusion exacerbated by exposure to specific organic chemicals, fragrances or volatile organic chemicals (VOCs) that outgas off of carpets, synthetic fibers or paints. Each patient experiences symptoms differently, which may be why the medical community has difficulty deciding that this is one diagnosis.

A **Unified Hypothesis** for these three conditions isn't meant to suggest that they are the same thing; this hypothesis suggests that the vagus nerve plays a role in the cause and perpetuation of the symptoms in these conditions.

The vagus nerve starts in the medulla, part of the brain stem, and it has dense upwards connections to the limbic system, the stress centers in the brain, made up of the amygdala, the hippocampus, the prefrontal cortex and the cingulate gyrus. When it leaves the skull and descends down through the neck into the trunk, it becomes the longest and most complex nerve in the body.

The vagus motor fibers start in the nucleus ambiguus and control every muscle that controls speech and swallowing and even some muscles of the face. The recurrent laryngeal nerve opens the vocal cords so you can breathe, and a different branch closes the vocal cords so you can make sounds. The vagus nerve is why you can speak. The superior laryngeal branch of the vagus is why you can scream or sing high notes. The vagus supplies the pre-ganglionic neurons for the heart muscle. It beats your heart. The vagus moves your digestive system and vagus secretory fibers are why you have saliva and mucous in your pharynx and larynx. The vagus controls the smooth muscles in your bronchi and esophagus. The vagus is why you can swallow. The left side of the vagus slows the left ventricle (AV node) and it is why you do not have ventricular tachycardia. The right vagus slows the atria (sino-atrial, SA node) and it is why you don't have atrial fibrillation.

The motor fibers of the vagus follow the esophagus through the diaphragm and control the esophageal sphincter that keeps the contents of the stomach out of your esophagus. The vagus is why you don't have reflux.

When you're under stress, your muscles and brain need glucose from the blood. The vagus has fibers to the

liver that stop the liver from producing glucose. These vagus fibers need to be quiet when the stress response from the sympathetic nerves and the adrenal glands send signals to the liver to pump out more glucose so you can run.

The visceral sensory fibers of the vagus are why you know you have pain anywhere in your abdomen—the stomach, the liver, pancreas, spleen, and the gut. The vagus has stretch receptors in the stomach that tell you when you should stop eating. The vagus sensory fibers are why you feel hunger, satiety and nausea. The visceral pain information from your heart, esophagus, and trachea travel up the vagus and make you cough and tell you you're having angina. The pressure receptors in the aortic arch and the airways tell your heart to slow down before something bursts. There are chemo receptors from the vagus in the aorta that tell your system that you need more bicarbonate from the pancreas. The vagus chemo receptors in the upper small intestine make you crave certain foods because you need certain nutrients. Those chemo receptors could also be responding to organic chemicals in the blood that cannot be processed by your liver because you lack the enzymes or substrate to take them apart. There aren't good references for this hypothesis, but it's a reasonable guess.

The recurrent branches of the vagus follow the posterior meningeal artery from the upper cervical spine into the skull. This branch is sensitive to dilation of the blood vessels in the posterior portion of the dura. This contributes to the sensation of headaches that happen when air pressure drops. Vagal nerve stimulators are approved for the treatment of migraine.

The vagus general sensory fibers carry sensations of touch, pain and temperature from the ear pharynx and larynx. The branch of the vagus for the ear (auricular branch) enters the superior vagal jugular ganglion and joins up with the C2-3 nerve root and the mandibular (lower) branch of cranial nerve V. The general sensory fibers from the pharynx and larynx join with the motor fibers.

This gets complicated but stay with it. It all makes sense and once you see it, you can't ever un-see it.

All of the general sensory fibers of this portion of the vagus synapse within

the spinal nucleus of Cranial Nerve V at the place where the cervical 3, 4 and 5 nerve roots exit the spine. Why is this important? In neurology you learn a memory trick, "C3-4-5 keep the diaphragm alive." It's why you cough when you put a cotton swab too far into your ear. It's why you cough when you get something in your throat that you didn't even know you swallowed. The sensory fibers of the vagus join up with the motor fibers of the nerve roots that

The symptoms of fibromyalgia, chronic fatigue, and multiple chemical sensitivity indicate vagal dysfunction.

control your diaphragm and make you cough before you even know you need to. It's automatic.

Basically, the vagus nerve keeps you alive. It beats and controls your heart, moves your digestive system, keeps you from choking, allows you to empty your bowels and tells you what to eat and when you're full, tells you that you have inflammation in your liver, pancreas or gut, regulates your blood sugar and allows you to breathe and speak.

And the vagus controls your immune system. This is where the vagus becomes crucial in FMS, CFS, and MCS. The vagus quiets the immune system by fibers that go from the celiac ganglion to the spleen to quiet T-cells and macrophages, and from the splenic nerve to the spleen to control antibody responses. Signals from the (afferent) vagus tell the brain when there is threat from infection, stress, or physical trauma. The brain sends signals down the vagus that tell the vagus to turn itself off or down. The (efferent) vagus by way of the celiac and splenic ganglia are now NOT turning off the macrophages, T-cells and antibodies in the spleen. If there is infection, stress, threat, or trauma, the vagus needs to be off to help with survival. The spleen and the immune system need to increase inflammation to fight infection and repair trauma.

Take a moment and think about that. When life is good, the vagus slows the heart, digests your food, reduces inflammation, and quiets immune response. When there is threat, stress, infection or trauma you don't need to digest your food, therefore you don't need digestive enzymes or stomach acid or gut motility. You don't need bronchial

relaxation or a slow heart rate; you need stress hormones and the sympathetic nerves to dilate the bronchi and speed up your heart so you can run. You don't need to sleep right now because you might miss your chance to run away if the threat eases for even a moment. You need to run away from the "tiger" that is chasing you.

When the vagus tells the brain that there is infection, threat, stress, or trauma, it sends those signals up from the body to the vagal nuclei in the medulla and that message goes directly up to the midbrain limbic system stress centers, the amygdala and the hippocampus, and others. The amygdala registers and mediates emotions and feelings. The hippocampus puts into subconscious, rarely conscious or sometimes conscious memory every "tiger" you've ever encountered. Every infection, every physical trauma, emotional trauma and every stress or threat is stored in the hippocampus so that the next time that threat is encountered, the hippocampus can remember how to get away from it faster. Short-term memory is reduced. There is only the "tiger." Long-term memory is specific for every bad thing that has ever happened because the only thing you need to remember is how you got away from the "tiger" the last time. That's why patients can only remember being sick since childhood. The threat receptors literally fire faster in the presence of very little objective external stimulus because the hippocampus remembers the last time this "tiger" was a threat.

And it doesn't matter what the "tiger" is. The "tiger" response is primitive and exactly the same whether it is a stressful job, an abusive spouse, hunger and lack of nutrients, a broken leg, torn connective tissue because you have Ehlers Danlos syndrome and your connective tissue is constantly stretching past its integrity, or toxic chemical exposure, a virus, parasite, worm or dental or mold infection. If there



FMS, CFS, & MCS

➤ is infection, stress or trauma, the vagus goes down or off, the immune system is unregulated, inflammation increases, and nothing works right.

Now go back and look at the symptoms of fibromyalgia, chronic fatigue, and MCS. The common features, the unifying factor, once you know all of the things the vagus does, is vagal dysfunction. But no one ever seems to think of it that way because there is no easy or risk-free way to treat the vagus. No one is going to install a vagal nerve stimulator because you have multiple chemical sensitivities, which they're not even sure are real. No one is going to install a vagal nerve stimulator because you have a sore throat and swollen lymph glands from a chronic infection that they call chronic fatigue syndrome. And they don't use vagal nerve stimulators for fibromyalgia even though 86% of fibromyalgia patients have irritable bowel and don't digest their food well. It's just too risky to install them and there are too many potential side effects, and it is really just easier to tell the patient to go on this diet, take these pills, and learn to live with it.

If you're lucky and have the right skills, you can treat the trauma, resolve the mold, virus, dental or parasite infection and the patient is not inherently sensitized from some early childhood trauma and the hippocampus tells the vagus that the threat is gone and it is OK to come back on. The vagus comes back on and the patient recovers. If you and your patient are both lucky.

Case Report

The patient was a 49-year-old female who had fibromyalgia for 18 years following an auto accident. Her pain had



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been between 4/10 and 8/10 for 18 years. Her symptoms included headaches, burning midscapular pain, hand, arm, leg, foot, neck, back and jaw pain. Over the years she had developed asthma, allergies, acne and irritable bowel syndrome and had been diagnosed with digestive system candida overgrowth.

Fortunately, her body pain responded to the Frequency Specific Microcurrent treatment for fibromyalgia associated with spine trauma. When the pain decreased so that it was consistently below a 4/10, her digestion improved, her immune system quieted down, the allergies to food and environmental factors disappeared, the asthma resolved, her sleep improved and her fatigue resolved as her adrenal function and diurnal rhythm returned.

She had twenty treatments between December 8 and March 15, and she used a home microcurrent unit as often as needed to keep her body pain below a 4/10 at all times. She had physical therapy to repair the pain generators in her neck and two sets of facet injections. She used one combination supplement for repairing her gut. Her acne and night vision cleared up when she was given an oil-based vitamin A supplement. No genetic testing was done, but it has been suggested that some patients can't convert beta-carotene into the active form of vitamin A. By February 8, after eight weeks of treatment, she no longer met the diagnostic criteria for fibromyalgia. Her pain was consistently between a 2/10 and a 4/10 without medication. She slept well without medication and her irritable bowel syndrome resolved. By March 15 she was discharged from treatment and in June she moved to Colorado where her recovery was maintained for at least six years.

Think about all of the confusing, multi-system symptoms that were simply a result of body pain that remained between a 4/10 and 8/10 for 18 years.

The body pain was eliminated by treating inflammation in the spinal cord, but the immune system activation, allergies and asthma were from the vagus.

Irritable bowel and candida. If your gut doesn't move, and your pancreas continues to secrete bicarbonate, but your stomach doesn't secrete as much acid as usual, your gut contents become alkaline and candida loves an alkaline environment. The friendly acid-loving bacteria don't thrive, and they aren't creating the short chain fatty acids and other products that repair your gut wall. The vagus. Again.

Sleep disruption resolved because the "tiger" was gone. The amygdala and hippocampus kept the threat response high because if the pain was a 7/10 there must be a "tiger." When the pain was a 2-4/10, the tiger was gone, and sleep was welcome.

We were lucky because she had no early childhood trauma to maintain the sensitization and the vagus came back on by itself once the pain resolved. In 2000, when she was a patient, the vagal treatment had not yet been developed.

In 2020, the vagus can be treated with FSM and treating the vagus can improve the speed of response; but if the cause of vagal dysfunction is not corrected, the limbic system can turn the vagus off faster than it can be turned back on. Knowing how the vagus works and how it creates symptoms in so many body systems helps make sense of it all and makes the patient presentation less overwhelming.

If you look for the cause of the infection, stress, threat, pain or trauma and resolve that, and if you're lucky, the limbic system will calm down and the vagus will come back on. If you need a little extra luck, Frequency Specific Microcurrent can give you a tool to help quiet the limbic system directly and turn the vagus back on. ◆

References and slides are available online at www.townsendletter.com.