

The Interconnectedness Between Anxiety and Inflammation

Analysis by [Dr. Joseph Mercola](#)

✓ Fact Checked

STORY AT-A-GLANCE

- › Anxiety is a physiological response to a threat that increases your inflammatory cytokine levels. If your body's inflamed, you're going to feel anxious
- › Cytokines are small proteins that serve to regulate different tissues. There are both proinflammatory and anti-inflammatory cytokines. Cytokines have specific relevance to COVID-19, as they modulate your immune system and its function
- › By reducing or resolving stress and anxiety, you lower levels of inflammatory cytokines, thereby allowing your immune system to function better
- › Processed foods cause inflammation, in part by increasing insulin resistance, which raises inflammatory cytokine production, and in part because they are loaded with proinflammatory industrially processed omega-6 vegetable seed oils
- › Strategies that will activate the vagus nerve, which induces relaxation and lowers inflammatory markers, include expressive writing, getting quality sleep, forgiveness practice, time-restricted eating and supplementing with exogenous ketones

This article was previously published November 8, 2020, and has been updated with new information.

Dr. David Hanscom, an orthopedic surgeon whom I've previously interviewed about strategies for chronic back pain, quit his practice to focus on educating others on becoming pain-free without surgery. After surviving COVID-19, he turned his attention to prevention and surviving it, which is an important part of this discussion.

We've known for some time now that with diet, exercise and other interventions, you can radically reduce your risk of COVID-19. The focus of Hanscom's COVID-19 prevention is on strengthening immune function through stress and anxiety reduction, and he has very specific and precise recommendations on how to do that.

As explained by Hanscom, pain is largely a symptom of stress and anxiety, which in turn are predicated on inflammation more so than psychological factors.

"You have to feel safe. When you feel safe, there's a profound shift in your body's chemistry. You're going from adrenalin, cortisol, histamines and inflammatory cytokines to growth hormone, dopamine, serotonin and GABA – all these incredible hormones and anti-inflammatory [compounds]. So, there's a profound shift in the body's chemistry, and people's pain disappears. They don't just manage the pain. The pain disappears."

Cytokines, Anxiety, Pain and Poor Immune Function

Cytokines are small proteins that serve to regulate different tissues. There are both proinflammatory and anti-inflammatory cytokines. Cytokines have specific relevance to COVID-19, as they modulate your immune system and its function.

“ Anxiety is a physiological response to a threat. Your whole body is on fire. You need to decrease anxiety, decrease cytokines, decrease that stress response. If your body's inflamed, you're going to feel anxious. ”

By reducing or resolving stress and anxiety, you lower levels of inflammatory cytokines, thereby allowing your immune system to function better. Hanscom has developed a working group that meets once a week to discuss and share information.

Other members of the group include Stephen Porges, Ph.D., a behavioral neuroscientist who developed Polyvagal 30, and Dr. David Clawson, a psychiatrist who specializes in

physical medicine and rehabilitation and who is very knowledgeable about cytokines.

"Cytokines are everywhere. Every cell in the body has cytokines. It's how they talk to each other. It turns out that the glial cells in your brain, that connect the tissue of the brain, put out cytokines. So do the endothelial cells, the linings of blood vessels.

When you have a threat – surgeons think in terms of muscle tension, sweating and heart rate – that to us is a threat response, versus safety where you relax and regenerate. What I didn't realize is that threat fires up the immune system, and 'threat' is all sorts of stuff. It's viruses, bacteria, cancer cells, a bully, a difficult boss, but also your thoughts, emotions and repressed emotions.

Neuroscience has shown us that those thoughts and emotions are processed in the brain the same way as a physical threat. It turns out that every degenerative disease is, what Clawson says, the same soup. In other words, we know that cardiac disease, critical vascular disease, adult onset diabetes, obesity, Parkinson's and Alzheimer's are just examples of inflammatory disorders. It's all inflammatory."

Anxiety Is a Symptom of Inflammation

When your autonomic nervous system becomes dysregulated, you can – as Hanscom did – go from feeling fine one day to having a panic attack out of the blue the next. He explains:

"It turns out that anxiety, bipolar, depression and schizophrenia are all inflammatory processes. It's inflammatory. It is not psychological. Remember, anxiety is a result of a threat. [Threat] is the cause.

The threat creates a bodily response, which includes your immune system, and that sensation generated by the adrenalin and cortisol and these inflammatory cytokines, that's the sensation of anxiety. Since the unconscious brain

processes about 20 million bits of information per second, and the conscious brain only processes 40, you can't do it with mind over matter.

I went to a psychiatrist for 13 years and talked and talked and talked ... but I got worse. And, see, the solution for chronic pain is actually changing your brain to go a different direction. If you talk about the problem, you're actually reinforcing it.

The way you decrease anxiety is simply decrease that stress response. And you do it through direct means: mindfulness, meditation, relaxation, anti-inflammatory diet. The anti-inflammatory diet turns out to be a huge deal ... because what happens when you're in a constant threat, i.e., inflammation, which includes processed foods, these inflammatory cells start destroying your body ...

The biggest message I want to get out there [is that] anxiety is a physiological response to a threat. Your whole body is on fire. You need to decrease anxiety, decrease cytokines, decrease that stress response. Again, if your body's inflamed, you're going to feel anxious."

With regard to diet, there are several reasons why processed foods cause inflammation. For starters, they tend to be very high in refined carbohydrates which, when consumed in excess, cause insulin resistance, thereby raising inflammatory cytokine production and massively increasing your risk of COVID-19. They're also loaded with industrially processed omega-6 vegetable oils, which are proinflammatory.

Lowering Inflammation Improves COVID-19 Survival

According to Hanscom, removing the threat and creating a sense of safety not only lowers inflammatory markers and eliminates pain, it also improves your immune system's ability to respond appropriately to fight off foreign invaders, be it SARS-CoV-2 or any other pathogen.

"The virus, of course, is the threat, [and] you want your immune system to respond. A vast majority of people fight off the virus very quickly, but the elephant in the room, the obvious factor that has to be looked at, is that almost every person that dies from COVID-19 has 'risk factors' ... [and] every one of these risk factors has elevated inflammatory markers.

The idea is, if you take charge of your health and lower those inflammatory markers, then we have this normal cytokine rise. In other words, the cytokines are your defense against the [virus]. We have this normal cytokine rise that stays below that threshold.

If you hit a certain threshold, the inflammatory response becomes too strong, and you flood your lungs out. You drown in your own fluids, because everything becomes inflamed. Almost every person that's passed away from COVID-19 has had some risk factor where this inflammatory process is going out of control."

The Vagus Nerve

As explained by Hanscom, your vagus nerve, the 10th cranial nerve which is the main part of your parasympathetic nervous system, acts as a brake on your sympathetic nervous system. Your sympathetic nervous system is activated in response to threats, whereas your parasympathetic nervous system is activated through the relaxation response.

"The Vagus nerve is seeing all this input, and it decides what to do with your body. There's a direct effect on metabolism, the endocrine system, your blood sugars, the cytokines. Under threat, the parasympathetic brake comes off ... There's two parts to the vagus nerve. The ventral part is connected to facial and neck muscles. It allows humans to socialize. It's called coregulation.

Instinctively we're a competitive species; we want to stay alive. When I walk up to you, I look at your facial expressions, you look at mine, and we do what's called coregulation, which calms down the autonomic nervous system. The problem with COVID-19 is we have masks on. We can't see each other's faces

and we're socially isolated. As Porges points out, it dysregulates the autonomic nervous system.

When I had my panic attack, it was a dysregulated autonomic nervous system, and there was this huge sympathetic charge of inflammatory cytokines. There's some question as to whether my panic attack was a cytokine storm, and then, once that happened, I couldn't control it.

Again, it's 20 million bits of information per second, compared to 40. The vagus nerve is the middle of this whole thing. What I'm excited about is that we look at stress as a psychological construct, and it is not. Remember, stress management is a misnomer, because the stress that's most stressful is the stress that you can't manage. It's a chronic stress.

What happens is, when you're under chronic threat, your immune system is fired up. Then people become socially isolated, which also fires up the immune system even more. You can't coregulate, you're socially isolated, your nerve conduction doubles, you feel the pain more, and when this autonomic response is sustained, there are over 30 physical symptoms that occur.

I had 17 of these at the same time. I had migraine headaches, ringing in my ears, skin rashes, stomach issues, back pain, neck pain, burning in my feet, it just went on and on and on. I had no idea what's going on. Again, the sensation is anxiety, which is not psychological, it's physiological.

Stress isn't the problem. It's this physiological response to the threat. And the way you calm down anxiety is simply drop down the body's chemistry. That's what I learned, sort of by accident, and then Porges filled in the gaps ...

When I do mindfulness, I'm actually directly lowering cytokines. That's not psychological, that's a true effect on my body. Same thing with diet. When you can link things like diet, relaxation and calming the nervous system to your inflammatory cytokines, it makes a big difference. That's a long answer to a simple question about linking these responses to your body's chemistry."

How to Activate Relaxation Response and Lower Inflammation

So, just how do you activate this vagal response to induce relaxation and lower your inflammatory markers? In the interview, Hanscom reviews several strategies known to do this, including the following:

- **Expressive writing** — According to Hanscom, there are more than 1,000 research papers showing expressive writing reduces viral load and inflammatory markers. How to do it: Simply write down your thoughts, then tear up the pages. As explained by Hanscom:

"You can't escape your thoughts, but you can separate from them. You tear them up for two reasons. One is to write with freedom, positive or negative.

The second one, which is more important, is to not analyze these things, because they're just thoughts. If you analyze and try to fix them, you actually reinforce them. What you're trying to do is stimulate neuroplasticity [through] awareness, separation, then redirection."

- **Quality sleep** — The writing helps with going to sleep, Hanscom says, but it's also important to get seven hours of sleep. "It's a big deal," he says.
- **Forgiveness practice** — The antidote to anxiety is control. If you lose control, your body secretes more stress hormones, more cytokines, triggering anger and anxiety. Knowing this is important to addressing pain control:

"They found that 90% of people in chronic pain have not let go of the situation that caused the problem in the first place, but interestingly enough, the person they haven't forgiven is themselves," Hanscom says.

"We find that in this healing process, anger and forgiveness are always a tipping point. When you're angry or fired up, you're in a constant threat. When you're trapped by anything, especially chronic pain or trapped in your house from COVID, you're frustrated. Well, that has cranked up your inflammatory cytokines."

- **Intermittent fasting or time-restricted eating** – There are several ways to do this. One of the easiest is simply to restrict your eating to a six- to eight-hour window each day, making sure you eat your last meal at least three hours before bed. Research has shown time-restricted eating will significantly lower your inflammatory markers.
- **Exogenous ketones** – While time-restricted eating and intermittent fasting will boost your ketone production, you can also use a ketone supplement. Ketones catalyze metabolic pathways that reduce inflammation. For example, they inhibit NLRP3 inflammasome and activate NRF2.

As explained by Hanscom, viruses also don't like ketones: They like sugar, so they can help lower viral replication. His work group has developed a nutritional protocol they believe could help solve the pandemic, as it affects every step of the viral stage.

"As far as COVID-19 is concerned, you have to take vitamin B and C. Vitamin D is a big deal. It's the No. 1 deficiency in the world. And then you have to take zinc and magnesium just for your enzymes to work," he says.

Other simple ways to activate your vagus nerve, thereby triggering the relaxation response and lowering inflammatory markers include the following. For more details about how these work, listen to the interview or read through the transcript.

Deep breathing exercises	Mindfulness
Melatonin	Relaxation
Humming	Listening to lullabies
Cold washcloth on your forehead	Acupuncture

More Information

To learn more, be sure to peruse Hanscom's "[Thrive and Survive](#)" manual, available on [BackInControl.com](#).¹ There, you can also find free guides² explaining expressive writing and other pain-treatment guidelines.

Hanscom is also the author of "Do You Really Need Spine Surgery?" available at your local bookstore, or online.

Lastly, Hanscom is in the process of creating a subscription-based app called DOC Journey,³ designed to help you resolve chronic pain without surgery. DOC stands for "direct your own care." The subscription includes virtual group coaching, live seminars, exclusive content and more.

"The app will take you through steps of what we call sematic work of calming things down, breathing, et cetera. It's very concise, and I think something that will be very effective," Hanscom says.

In closing, I'd like to reiterate one of the key take-home messages Hanscom stressed in this interview, namely that "anxiety is a physiological response to a threat. If your body is inflamed, you're going to feel anxious." And, that the answer, not just for anxiety, stress and pain, but also for general immune system health, is to implement strategies that reduce your stress response, make you feel safe again and lower inflammation.

Sources and References

- ¹ [Backincontrol.com, Thrive and Survive](#)
- ² [Backincontrol.com Free Guides](#)
- ³ [thedocjourney.com](#)