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Understanding Inflammation

Why It Matters—and What You Can Do About It

Inflammation has become one of the most important topics in modern medicine because it plays a role in nearly every chronic disease we see today. Heart disease, diabetes, Alzheimer's disease, arthritis, autoimmune conditions, digestive disorders, chronic pain, depression, obesity, and many cancers are associated with chronic inflammation.

The good news is that inflammation is not simply something that happens to us. It is a dynamic process that often responds remarkably well when we identify and address its underlying causes.

One of the biggest misconceptions is that inflammation is always harmful. In reality, inflammation is one of the body's greatest protective mechanisms. If you cut your finger or catch a virus, your immune system immediately responds by sending specialized cells to fight infection, remove damaged tissue, and begin the healing process. Once the danger has passed, the inflammation naturally settles down.

This type of inflammation is both normal and necessary. Without it, wounds would not heal and infections could become life-threatening.

Problems arise when the inflammatory response never completely turns off. Instead of protecting us for a few days, the immune system remains activated for months or even years. This persistent, low-grade inflammation may not produce obvious symptoms at first, but over time it can affect nearly every system in the body.

Many people experience fatigue, brain fog, headaches, digestive problems, muscle aches, joint pain, poor sleep, anxiety, depression, skin problems, weight gain, or difficulty concentrating long before a specific disease is diagnosed. Rather than viewing these as completely separate problems, functional medicine asks whether they may represent different expressions of an underlying inflammatory process.

Think of Your Body's Alarm System

One helpful way to understand chronic inflammation is to think about your body's alarm system.

A smoke detector is designed to alert us when there is a fire. That alarm is incredibly valuable because it keeps us safe. But imagine if the smoke detector became so sensitive that it sounded every time you made toast or took a hot shower.

The problem is no longer the alarm itself—it is that the alarm has become overly sensitive.

The immune system can behave in much the same way. After years of chronic stress, poor sleep, blood sugar imbalance, infections, mold exposure, environmental toxins, poor nutrition, or emotional trauma, the body's alarm system may remain activated even after the original threat has passed.

The Inflammation “Bucket”

Another helpful analogy is to imagine your body as a bucket.

Throughout life, different stressors gradually fill that bucket. Poor sleep adds a little water. Chronic stress adds a little more. Processed foods, blood sugar problems, infections, hormone changes, environmental toxins, mold exposure, and emotional trauma each contribute a little more.

For many years, the bucket may continue filling without causing noticeable symptoms. Eventually, however, one additional stressor causes the bucket to overflow.

That overflow may appear as fatigue, chronic pain, digestive symptoms, migraines, autoimmune symptoms, anxiety, or brain fog.

In many cases, there isn't one single cause. Symptoms develop because multiple stressors have accumulated over time. Our job is to figure out what is filling the bucket and begin reducing the total load.

Everything Is Connected

One of the most important concepts in functional medicine is that the body functions as one integrated system rather than a collection of separate organs.

The brain communicates with the immune system. The immune system communicates with the gut. Hormones influence metabolism. The nervous system affects digestion and immune function. Blood vessels nourish every tissue in the body.

Because these systems are interconnected, inflammation in one area can eventually affect many others. This also helps explain why two people with similar inflammatory processes can experience very different symptoms.

What Drives Chronic Inflammation?

Many different factors can contribute, including:

- Processed foods and excess sugar
- Blood sugar and insulin problems

- Poor sleep
- Chronic emotional stress
- Sedentary lifestyles
- Excess body fat
- Smoking and excessive alcohol
- Environmental toxins
- Food sensitivities
- Chronic infections
- Mold exposure
- Hormonal imbalances
- An unhealthy gut microbiome

Genetics can influence our vulnerability, but genes are not necessarily destiny. Our lifestyle, environment, nutrition, stress, sleep, and other factors can strongly influence how those genes are expressed.

The Gut and Inflammation

The digestive tract deserves special attention because a large portion of our immune system is located within and around the gut.

A healthy intestinal barrier and diverse microbiome help regulate inflammation and teach the immune system what is safe and what may be dangerous. Beneficial gut bacteria also produce substances called short-chain fatty acids that help nourish the intestinal lining and regulate immune function.

When the microbiome becomes imbalanced or the intestinal barrier is disrupted, inflammatory signals may increase and affect areas far beyond the digestive tract—including the brain, skin, joints, metabolism, and immune system.

Supporting gut health is therefore often an important part of reducing chronic inflammation.

Blood Sugar, Circulation, and Inflammation

Blood sugar is another major contributor.

Repeated spikes in blood sugar and insulin can increase oxidative stress and activate inflammatory pathways—even before someone develops diabetes.

Over time, high blood sugar can also damage the delicate lining of our blood vessels, impair circulation, and interfere with the delivery of oxygen and nutrients to tissues throughout the body, including the brain.

Maintaining healthy blood sugar is therefore about much more than preventing diabetes. It is an important part of protecting our blood vessels, brain, metabolism, and long-term health.

Stress Causes Real Biological Changes

Although we often think of stress as an emotional problem, stress produces very real changes in the nervous system, hormones, blood sugar, digestion, and immune system.

Thousands of years ago, stress might have meant escaping from a predator. Today, it may come from deadlines, financial concerns, family responsibilities, caregiving, traffic, lack of sleep, relationships, or the constant stimulation of modern life.

The source has changed, but many of our biological responses have not.

When the stress response remains activated, the body continues receiving the message that it may not be safe. This can make it more difficult for inflammation to resolve.

Learning to regulate the nervous system through meditation, prayer, deep breathing, time in nature, expressive journaling, mindfulness, play, and healthy relationships can help change this physiology over time.

Creating an Anti-Inflammatory Environment

The encouraging news is that chronic inflammation is dynamic. Our bodies are remarkably adaptable, and many of the systems involved in inflammation can change when their environment changes.

Eating a nutrient-dense, minimally processed diet, balancing blood sugar, exercising regularly, improving sleep, supporting gut health, spending time outdoors, reducing chronic stress, avoiding tobacco, limiting alcohol, cultivating healthy relationships, and addressing hidden contributors such as infections or environmental toxins can all help shift the body toward healing.

Functional medicine focuses on identifying the unique combination of factors contributing to each individual's inflammation rather than searching for a single diagnosis or a single treatment.

Every person's story is different, which means the path forward will also be different.

Additional Tools: Hyperbaric Oxygen & Ozone Therapy

In addition to the basics—nutrition, sleep, movement, blood sugar, gut health, and nervous-system regulation—there are other therapies that may help the body calm inflammation and support healing.

Hyperbaric Oxygen Therapy (HBOT) involves breathing oxygen while resting inside a pressurized chamber. This allows much more oxygen to reach the blood and tissues than we can normally deliver through breathing alone.

Why does that matter? **Our cells need oxygen to make energy and repair themselves.** When tissues are injured or inflamed, circulation and oxygen delivery may not be working as well as they should. HBOT can help increase the amount of oxygen available to those tissues, while also supporting circulation, brain and mitochondrial function, tissue repair, and a healthier inflammatory response.

Ozone therapy works a little differently. Instead of simply giving the body more oxygen, ozone provides a small, controlled stimulus that encourages the body to turn on its own protective and antioxidant systems.

I like to compare this to exercise. Exercise temporarily challenges the body, but that challenge sends a signal telling the body to adapt and become stronger. Ozone can create a similar type of response at the cellular level.

This may help the body better handle oxidative stress, regulate inflammation, improve circulation, and support mitochondrial function and cellular energy production.

I think of both HBOT and ozone as tools that can help **create a better environment for healing.** They aren't substitutes for good nutrition, sleep, gut health, movement, or addressing the underlying causes of inflammation. Instead, they can be used alongside those foundational strategies to give the body additional support.

Importantly, these therapies are not right for everyone at every stage of healing. The goal is always to choose **the right therapy for the right person at the right time.**

Practical Steps You Can Begin Today

While there is no single “anti-inflammatory cure,” small daily habits can have a profound impact over time.

- Eat mostly whole, minimally processed foods and include plenty of colorful vegetables, healthy fats, quality protein, and fiber.
- Keep blood sugar stable by limiting sugary drinks, refined carbohydrates, and frequent snacking.
- Aim for 7–9 hours of quality sleep each night.
- Move your body every day through walking, strength training, stretching, or another enjoyable physical activity.
- Practice daily nervous-system regulation through deep breathing, meditation, prayer, gratitude, expressive journaling, or time in nature.
- Support a healthy gut with a diverse, fiber-rich diet and address digestive symptoms when they are present.
- Stay well hydrated and spend time outdoors whenever possible.
- Work with your healthcare provider to identify and address hidden sources of inflammation such as chronic infections, mold exposure, food sensitivities, hormone imbalances, sleep apnea, or environmental toxins.

Remember

Inflammation is not the enemy. It is one of the body's oldest and most important survival mechanisms.

Healing does not come from simply fighting inflammation. It comes from understanding **why the body has remained in a protective state** and creating the conditions that allow it to restore balance.

Sometimes that means changing what we eat. Sometimes it means improving sleep, healing the gut, stabilizing blood sugar, or addressing chronic stress. Sometimes we may also use therapies such as HBOT or ozone to support cellular resilience and recovery.

The goal is not to do everything at once. It is to identify the biggest contributors, address them in the right order, and give the body what it needs to move from **protection toward repair**.

When we do that, the body often demonstrates a remarkable capacity to heal.