Modern Lifestyle May Be Driving Inflammation, and Your Gut Is at the Center of It

Inflammation has become one of the most commonly used (and frequently oversimplified) words in conversation about health.

We hear about inflammatory foods, anti-inflammatory diets, inflammatory diseases, and supplements promising to reduce inflammation. But inflammation itself is not inherently harmful.

In fact, we can't survive without it.

Inflammation is part of the immune system's highly sophisticated defense response. When we develop an infection or injure ourselves, immune activation helps eliminate the threat, repair damaged tissue, and eventually return the body to its normal state.

The problem begins when that response does not fully switch off.

In a recent conversation, I spoke with gastroenterologist Dr. Will Bulsiewicz about this distinction and about an increasingly important question:

Why has chronic, low-grade inflammation become so common in modern society?

When a Protective Response Becomes Chronic

Of course, our discussion eventually led us far beyond inflammation and into the gut microbiome, the intestinal barrier, diet, stress, social connection, and a fundamental mismatch between the world our biology evolved for and the one we inhabit today.

Acute inflammation is temporary and purposeful.

Chronic, low-grade inflammation is different: instead of mounting a strong response to an immediate threat and then resolving, the immune system remains persistently activated at a lower level.

That distinction matters because immune activation doesn't remain confined to one organ.

The immune system communicates throughout the body, meaning chronic inflammatory signaling can potentially influence metabolism, cardiovascular health, the gastrointestinal tract, and even the brain.

But rather than asking how we can simply "turn inflammation off," I believe the more interesting question is:

An Ancient Biology Living in a Very New World

What continues telling the immune system that something is wrong?

Human physiology developed over hundreds of thousands of years.

Our immune response, stress response, digestive system, brain-gut communication networks, and relationship with the microbial world evolved under environmental conditions dramatically different from those surrounding us today.

Our genes change slowly.

Our environment does not.

During approximately the last century, our food supply, physical activity, exposure to technology, social structures, sleep patterns, medications, stressors, and daily environments have changed at an extraordinary speed.

Our biology simply has not had enough time to catch up.

I think this evolutionary mismatch may be one of the most useful ways of understanding the modern epidemic of chronic disease.

We can see clues when studying populations that have historically maintained lifestyles closer to those under which human physiology evolved. These populations often possess extraordinarily diverse gut microbiomes and historically experienced far fewer of the chronic conditions common in industrialized societies.

Unfortunately, when traditional lifestyles become Westernized, many of those advantages begin disappearing.

The lesson is not that we should abandon modern civilization.

The Microbiome Sits at an Important Intersection

It is that convenience sometimes comes with biological consequences.

One place where this mismatch becomes particularly visible is the gut microbiome.

The gastrointestinal tract contains an enormous microbial ecosystem living immediately adjacent to one of the body's largest interfaces with the outside world.

Separating those microbes from the immune system is a remarkably sophisticated intestinal barrier.

We often describe this barrier as a single layer of epithelial cells connected by tight junction proteins. But that description is incomplete.

Between intestinal contents and those cells lies a protective mucus layer containing microbes, microbial metabolites, antimicrobial compounds, and immune sensors.

This distinction is important.

Popular discussions often suggest that inflammation begins when the gut simply becomes "leaky," allowing bacteria or bacterial components to pass through physical gaps in the intestinal wall.

In reality, the process is probably more nuanced.

Changes in the microbiome may first alter the protective mucus layer and communication between microbes and immune cells. A compromised mucus environment can expose immune sensors to microbial signals even before substantial structural damage to the epithelial barrier occurs.

Where Fiber Enters the Story

In other words, intestinal inflammation may begin not simply as a mechanical barrier problem, but as a communication problem between microbes and the immune system.

This is also where diet becomes extremely important.

Our gut microbes metabolize dietary fiber and produce compounds known as short-chain fatty acids, including acetate, propionate, and butyrate.

Butyrate is particularly interesting because it helps support the cells lining the colon, the intestinal mucus layer, tight junction integrity, and immune activity regulation.

When microbes are deprived of the fibers they evolved to consume, this system can change.

And fiber is not the only important component of plant foods.

Plants contain thousands of bioactive compounds, including polyphenols. Many polyphenols are not simply absorbed directly into the bloodstream. Instead, they encounter the gut microbiome, where microbes transform them into metabolites that then affect elsewhere in the body.

This is one reason I have long emphasized the importance of eating a wide variety of plant foods.

The goal is not simply to eat "more vegetables."

Microbial ecosystems thrive on diversity.

Different plants provide different fibers, polyphenols, and nutrients, which support different microbial populations and metabolic functions.

Is the Mediterranean Diet Really About Food?

Rather than obsessing over one superfood, we should think about feeding an ecosystem.

Large studies have provided impressive evidence supporting Mediterranean-style eating patterns, including benefits for cardiovascular health and markers associated with inflammation.

But my travels throughout Italy have made me wonder whether we sometimes define the Mediterranean diet too narrowly.

The Mediterranean lifestyle is not simply a collection of ingredients.

Meals are frequently social events.

People walk.

Families and friends gather.

Food is prepared and shared, rather than hurriedly consumed in the car or in front of a computer or TV.

There is a rhythm surrounding eating that is very different from what has become "normal" in many industrialized societies.

This raises an important question:

How much of the benefit comes from the food itself, and how much comes from lifestyle instead?

Your Microbiome Is Listening to More Than Your Diet

The answer is probably both.

One of the most important themes of this particular discussion was that gut health cannot be reduced to food.

The gut microbiome is influenced by an enormous number of environmental factors.

Stress matters

Sleep matters

Physical activity matters

Medications matter

Early-life experiences matter

And perhaps more surprisingly, our relationships with other people matter.

We evolved as intensely social organisms. For most of human history, survival depended upon belonging to a group.

Social connection signaled safety. Isolation could signal danger.

Those ancient circuits remain part of our nervous system today.

Chronic loneliness or psychological stress can increase activity within the sympathetic nervous system, otherwise known as the "fight-or-flight" response. Through the brain-gut axis, these signals reach the gastrointestinal tract, where they can influence gut function and even microbial behavior.

This is why I believe discussions about longevity that focus exclusively on diet, supplements, or the latest biohacking technology are missing something fundamental.

Purpose... Connection... Community...

MATTERS.

These are not vague wellness concepts.

The Body Does Not Recognize Medical Specialties

They are biological inputs.

Modern medicine divides the body into specialties because doing so makes an extraordinarily complex system easier to study.

We have:

- Gastroenterologists
- Cardiologists
- Neurologists
- Endocrinologists
- Psychiatrists
- Immunologists

But the body itself recognizes none of these divisions.

The brain communicates with the gut.

The gut communicates with the immune system.

The immune system communicates with the brain.

Microbial metabolites enter circulation.

Stress alters gastrointestinal physiology.

Diet influences microbial metabolism.

Social experiences influence neural signaling.

Everything is connected.

This systems view may ultimately be far more useful for understanding chronic disease than searching endlessly for a single culprit.

There is rarely one cause.

We Probably Know More Than We Think We Do

Instead, many relatively small influences accumulate and interact until the system shifts toward either resilience or disease.

Science must continue advancing.

Many fundamental questions about the microbiome, immune system, brain-gut axis, and chronic disease remain unanswered.

But there is an interesting paradox.

While the science becomes increasingly sophisticated, many of the actions available to us today remain remarkably simple.

→ Eat a wide variety of minimally processed plant foods

→ Increase dietary fiber gradually and consistently

→ Consume foods naturally rich in polyphenols

→ Move your body

→ Spend time outdoors

→ Prioritize restorative sleep

→ Manage chronic stress

→ Cultivate meaningful relationships

→ Share meals when you can

→ Create a sense of purpose

None of these recommendations is technologically exciting.

Perhaps that is exactly why they are so easily overlooked.

We live in a culture attracted to complex solutions:

- Advanced testing
- Supplements
- Medications
- Personalized algorithms
- Increasingly sophisticated technologies

Some of these innovations will undoubtedly improve medicine.

Creating a Healthier "Normal"

But they should not distract us from addressing the environment that helped create the problem.

We cannot wait for society to create the perfect environment for our health.

The modern environment encourages convenience, sedentary behavior, highly processed food, chronic stimulation, social isolation, and increasingly fragmented attention.

If we simply follow what has become culturally "normal," we may be following a lifestyle profoundly different from the one our biology expects.

That doesn't mean returning to life as hunter-gatherers.

It means becoming more deliberate about the environment we create within modern life.

We can create a home where:

- Where whole foods are normal.
- Where meals are shared.
- Where movement is part of everyday life.
- Where sleep is protected.
- Where technology occasionally gets turned off.
- Where relationships receive time and effort.
- And where health is understood not as the absence of disease, but as the result of many interconnected systems functioning in balance.

There is no single perfect diet or lifestyle that works for everyone.

For one person, the most important change may be dietary. For another, it may be addressing chronic stress, trauma, loneliness, sleep, or physical inactivity.

There are many paths toward better health.

The important thing is recognizing that the gut, brain, immune system, environment, and our everyday experiences are not separate stories.

They are different chapters in the same one.

Frequently Asked Questions

1 What's the difference between acute and chronic inflammation?

Inflammation is a natural and essential part of the body's immune response. Acute inflammation helps us fight infections, heal injuries, and repair damaged tissues before returning to normal. Chronic inflammation occurs when the immune system remains activated at a low level over time. Unlike acute inflammation, this persistent immune activity can affect multiple systems throughout the body, including metabolism, cardiovascular health, the gut, and the brain.

2 How does the gut microbiome influence inflammation?

The gut microbiome communicates continuously with our immune system. Beneficial microbes help maintain the protective intestinal mucus layer, support the gut barrier, and produce compounds that regulate immune activity. When this microbial ecosystem becomes disrupted, communication between microbes and immune cells may change, potentially contributing to chronic inflammation. It's a more complex process than simply having a "leaky gut."

3 Why are fiber and plant diversity so important for gut health?

Different plant foods provide different fibers, polyphenols, and nutrients that nourish our gut microbes. When microbes ferment dietary fiber, they produce beneficial compounds called short-chain fatty acids, including butyrate, which supports the intestinal lining and helps regulate immune activity. Eating a wide variety of plant foods encourages microbial diversity and supports the many functions of this important ecosystem.

4 Can stress and loneliness really affect the gut microbiome?

Yes. Through the brain-gut axis, psychological stress and social experiences can influence gastrointestinal function and the environment in which gut microbes live. Chronic stress and loneliness can activate the body's fight-or-flight response, affecting communication between the nervous system, gut, and immune system. This is one reason meaningful relationships, social connection, and stress management deserve a place in conversations about gut health.

5 Is the Mediterranean diet beneficial because of the food or the lifestyle?

Most likely, both. Mediterranean-style eating patterns emphasize vegetables, fruits, legumes, whole grains, olive oil, and other minimally processed foods associated with favorable health outcomes. But traditional Mediterranean lifestyles often include regular movement, shared meals, strong social connections, and a more relaxed approach to eating. These habits may work together to support metabolic health, gut function, and overall well-being.

6 What are the most important everyday habits for reducing chronic inflammation?

Rather than searching for one perfect diet, supplement, or health intervention, Dr. Mayer emphasizes creating an environment that supports the body's interconnected systems. Eating diverse plant foods, increasing fiber gradually, moving regularly, prioritizing sleep, managing stress, and maintaining meaningful relationships are practical places to begin. Small, consistent changes across several areas of life may be more valuable than focusing on a single solution.