

# Heal Your Gut

By [Chris Kresser](#)

All disease begins in the gut. - Hippocrates

Hippocrates said this more than 2,000 years ago, but we're only now coming to understand just how right he was. Research over the past two decades has revealed that gut health is critical to overall health, and that an unhealthy gut contributes to a wide range of diseases including diabetes, obesity, rheumatoid arthritis, autism spectrum disorder, depression and chronic fatigue syndrome.

In fact, many researchers (including myself) believe that supporting intestinal health and restoring the integrity of the gut barrier will be one of the most important goals of medicine in the 21st century.

There are two closely related variables that determine our gut health: the intestinal microbiota, or "gut flora", and the gut barrier. Let's discuss each of them in turn.

## The gut flora: a healthy garden needs healthy soil

Our gut is home to approximately [100,000,000,000,000 \(100 trillion\) microorganisms](#). That's such a big number our human brains can't really comprehend it. One trillion dollar bills laid end-to-end would stretch from the earth to the sun – and back – with a lot of miles to spare. Do that 100 times and you start to get at least a vague idea of how much 100 trillion is.

The human gut contains [10 times more bacteria than all the human cells in the entire body](#), with over 400 known diverse bacterial species. In fact, you could say that **we're more bacterial than we are human**. Think about that one for a minute.

We've only recently begun to understand the extent of the gut flora's role in human health and disease. Among other things, the gut flora promotes normal gastrointestinal function, provides protection from infection, regulates metabolism and comprises more than 75% of our immune system.

Dysregulated gut flora has been linked to diseases ranging from autism and depression to autoimmune conditions like Hashimoto's, inflammatory bowel disease and type 1 diabetes.

Unfortunately, several features of the modern lifestyle directly contribute to unhealthy gut flora:

- Antibiotics and other medications like birth control and NSAIDs
- Diets high in refined carbohydrates, sugar and processed foods
- Diets low in fermentable fibers
- Dietary toxins like wheat and industrial seed oils that cause leaky gut
- Chronic stress
- Chronic infections

Antibiotics are particularly harmful to the gut flora. Recent studies have shown that antibiotic use causes a [profound and rapid loss of diversity and a shift in the composition of the gut flora](#). This diversity **is not recovered** after antibiotic use without intervention.

We also know that infants that aren't breast-fed and are born to mothers with bad gut flora are more likely to develop unhealthy gut bacteria, and that these early differences in gut flora may predict overweight, diabetes, eczema/psoriasis, depression and other health problems in the future.

## The gut barrier: the gatekeeper that decide what gets in and what stays out

Have you ever considered the fact that the contents of the gut are technically **outside the body**? The gut is a hollow tube that passes from the mouth to the anus. Anything that goes in the mouth and isn't digested will pass right out the other end. This is, in fact, one of the most important functions of the gut: to prevent foreign substances from entering the body.

When the intestinal barrier becomes permeable (i.e. "leaky gut syndrome"), large protein molecules escape into the bloodstream. Since these proteins don't belong outside of the gut, the body mounts an immune response and attacks them. Studies show that these attacks play a role in the development of autoimmune diseases like Hashimoto's and type 1 diabetes, among others.

In fact, experts in mucosal biology like Alessio Fasano now believe leaky gut is [a precondition to developing autoimmunity](#):

There is growing evidence that increased intestinal permeability plays a pathogenic role in various autoimmune diseases including [celiac disease] and [type 1 diabetes]. Therefore, we hypothesize that besides genetic and environmental factors, loss of intestinal barrier function is necessary to develop autoimmunity.

The phrase "leaky gut" used to be confined to the outer fringes of medicine, employed by alternative practitioners with letters like D.C., L.Ac and N.D. after their names. Conventional researchers and doctors originally scoffed at the idea that a leaky gut contributes to autoimmune problems, but now they're eating their words. It has been

repeatedly shown in several well-designed studies that the [integrity of the intestinal barrier is a major factor in autoimmune disease](#).

This new theory holds that the intestinal barrier in large part determines whether we tolerate or react to toxic substances we ingest from the environment. The breach of the intestinal barrier (which is only possible with a “leaky gut”) by food toxins like gluten and chemicals like arsenic or BPA causes an immune response which affects not only the gut itself, but also other organs and tissues. These include the [skeletal system, the pancreas, the kidney, the liver and the brain](#).

This is a crucial point to understand: **you don’t have to have gut symptoms to have a leaky gut**. Leaky gut can manifest as skin problems like eczema or psoriasis, heart failure, autoimmune conditions affecting the thyroid (Hashimoto’s) or joints (rheumatoid arthritis), mental illness, autism spectrum disorder, depression and more.

Researchers have identified a protein called zonulin that [increases intestinal permeability](#) in humans and other animals. This led to a search of the medical literature for illnesses characterized by increased intestinal permeability (leaky gut). Imagine their surprise when the researchers found that many, if not most, autoimmune diseases – including celiac disease, type 1 diabetes, multiple sclerosis, rheumatoid arthritis and inflammatory bowel disease – are characterized by abnormally high levels of zonulin and a leaky gut. In fact, researchers have found that they can induce type 1 diabetes almost immediately in animals by exposing them to zonulin. They develop a leaky gut, and begin producing antibodies to islet cells – which are responsible for making insulin. In [Step #1: Don’t Eat Toxins](#), I explained that one of the main reasons we don’t want to eat wheat and other gluten-containing grains is that they contain a protein called gliadin, which has been shown to increase zonulin production and thus directly contribute to leaky gut.

But what else can cause leaky gut? In short, the same things I listed above that destroy our gut flora: poor diet, medications (antibiotics, NSAIDs, steroids, antacids, etc.), infections, stress, hormone imbalances, and neurological conditions (brain trauma, stroke and neurodegeneration).

## [Leaky gut = fatigued, inflamed and depressed](#)

Here’s the takeaway. Leaky gut and bad gut flora are common because of the modern lifestyle. If you have a leaky gut, you probably have bad gut flora, and vice versa. And when your gut flora and gut barrier are impaired, you will be inflamed. Period.

This systemic inflammatory response then leads to the development of autoimmunity. And while leaky gut and bad gut flora may manifest as digestive trouble, in many people it does not. Instead it shows up as problems as diverse as heart failure, depression, brain fog, eczema/psoriasis and other

skin conditions, metabolic problems like obesity and diabetes and allergies, asthma and other autoimmune diseases.

To adequately address these conditions, you must **rebuild healthy gut flora and restore the integrity of your intestinal barrier**. This is especially true if you have any kind of autoimmune disease, whether you experience digestive issues or not.

## How to maintain and restore a healthy gut

The most obvious first step in maintaining a healthy gut is to avoid all of the things I listed above that destroy gut flora and damage the intestinal barrier. But of course that's not always possible, especially in the case of chronic stress and infections. Nor did we have any control over whether we were breast-fed or whether our mothers had healthy guts when they gave birth to us.

If you've been exposed to some of these factors, there are still steps you can take to restore your gut flora:

- Remove [all food toxins](#) from your diet
- Eat plenty of fermentable fibers (starches like sweet potato, yam, yucca, etc.)
- Eat fermented foods like kefir, yogurt, sauerkraut, kim chi, etc., and/or take a high-quality, multi-species probiotic
- Treat any intestinal pathogens (such as parasites) that may be present
- Take steps to manage your stress