Leaky Gut Syndrome

**What Is It?**

As food passes through the stomach into the small intestine, nutrient absorption occurs through the semi-permeable mucous lining of the wall of the small intestine. This membrane also shields the bloodstream from unwanted toxins, pathogens and undigested food. In this respect, the gut lining is a vital part of the body’s immune system because it limits the volume of potential invaders.

Leaky gut syndrome (or increased intestinal permeability) is a condition that develops when the mucous lining of the small intestine becomes too porous, allowing entry of toxins, microorganisms and undigested food particles, as well as pathogens, into the bloodstream. The function of the mucous lining of the small intestine can be compared to that of a window screen which lets air in, but keeps bugs out. It is also like the skin in that it sloughs off a layer of cells naturally every three to five days, and produces new cells to maintain healthy function.

**What Causes It?**

When digestion is impaired by such factors as stress, processed food consumption, inadequate chewing, excessive fluid intake with meals, improper food combining, and overeating, it can lead to an excessively permeable (leaky) gut. Here’s why: When bacteria present in the intestine act upon undigested food particles, toxic chemicals and gases are produced. These intestinal toxins, known as endotoxins, can damage the mucosal lining resulting in increased intestinal permeability. As a result of repeated attacks by these toxins, the gut lining erodes over time. This is the basic mechanism by which leaky gut comes into being. It can also be caused or aggravated by a number of other factors, including:

- Alcohol (gut irritant)
- Caffeine (gut irritant)
- Parasites (introduced into the body by contaminated food and water)
- Pathogenic bacteria (introduced into the body by contaminated food and water)
- Pathogenic Candida infection (due to overgrowth)

Perhaps the greatest contributors to leaky gut are the drugs listed below:

- Food sensitivities
- Chemical food additives (dyes, preservatives, flavorings, etc.)
- Pesticide-laden foods
- Enzyme deficiencies (as found in celiac disease and lactose intolerance)
- Diet of refined carbohydrates (“junk” food)
- Prescription hormones (like birth control pills)
- Mold and fungal mycotoxins (in stored grains, fruit and refined carbohydrates and found in water-damaged buildings)
- Heightened exposure to environmental toxins
- Dental toxins (from restorative materials and invasive procedures)
- Free radicals
- Stress

NSAIDs (Nonsteroidal anti-inflammatory drugs, like aspirin and Motrin)

Antacids
DIGESTION IN BALANCE
A healthy digestive tract has a semipermeable mucosal lining that helps prevent undigested food and toxins from entering the bloodstream. Fully digested nutrients and liquids may pass through to nourish the body.

DIGESTION OUT OF BALANCE
An out-of-balance digestive tract can have a porous mucosal lining, also called a leaky gut. Undigested foods and toxins can pass through to enter the bloodstream. The resulting inflammation can spread from the gut to the rest of the body.
Destruction of Intestinal Lining Leading to Leaky Gut

- Steroids (includes prescription corticosteroids such as prednisone and hydrocortisone)
- Antibiotics (which lead to overgrowth of bad bacteria in the GI tract)

Prolonged use of NSAIDs blocks the body’s natural ability to repair the intestinal lining. Once endotoxins have eroded this membrane, it becomes permeable rather than semi-permeable. (“The screen on your window gets holes in it.”) Now the toxins, pathogens and food particles, which would normally not be permitted to enter the system, literally leak into the bloodstream. The body then attacks these unwanted toxins, developing antibodies to fight the foreign substances.

People of any age can have leaky gut syndrome. Those who regularly take any of the drugs listed previously would very likely suffer from the syndrome whether they’ve been diagnosed with it or not. People with digestive problems (with or without symptoms) will probably have an underlying leaky gut condition, as will people who routinely use large amounts of alcohol and caffeine, and those who eat a diet that is high in refined carbohydrates and chemical food additives, which is, unfortunately, the Standard American Diet (SAD).

Anyone who has had significant toxic exposure may develop leaky gut. Gut-damaging toxins may come from pathogens such as bacteria, viruses, fungi and parasites, or from chemicals and heavy metals in the environment (or in the mouth in the form of dental restorations). Folks who have autoimmune diseases such as those listed below most likely have an underlying gut permeability problem as well.

**What Are the Signs and Symptoms?**

The long-term net result of leaky gut syndrome is the likely development of autoimmune disease in which the body attacks its own tissues. There are some 80 recognized autoimmune diseases. These include:

- Lupus
- Alopecia areata
- Rheumatoid arthritis
- Polymyalgia
- Multiple sclerosis rheumatica
- Fibromyalgia
- Chronic fatigue syndrome
- Celiac disease
- Vitiligo syndrome
- Thyroiditis
- Vasculitis
- Crohn’s disease
- Ulcerative colitis
- Urticaria (hives)
- Diabetes
- Psoriasis

Physicians are becoming increasingly aware of the importance of the GI tract in the development of autoimmune diseases. In fact, researchers now estimate that more than two-thirds of all immune activity occurs in the gut. Allergies can develop when the body produces antibodies to the undigested proteins derived from previously harmless foods. These antibodies can get into any tissue and trigger an inflammatory reaction when that food is eaten. Depending on where this inflammation occurs in the body—in the joints, brain, lungs, blood vessels or gut—a variety of chronic illnesses can develop as a result.

Other disorders associated with leaky gut include eczema, psoriasis, pancreatic insufficiency, candidiasis, non-alcoholic fatty liver disease (NAFLD), multiple chemical sensitivities and even heart disease. Leaky gut can aggravate existing conditions as well, for it can give rise to such symptoms as:

- Fatigue
- Joint pain
- Muscle pain

Did You Know

Digestive disorders, including indigestion, nausea and vomiting, currently drive almost 38 million Americans into their doctor’s offices each year.

Leaky gut syndrome can also cause malabsorption, and thus, deficiencies of many important nutrients—vitamins, minerals and amino acids—due to inflammation and the presence of potent toxins. This malabsorption can also cause gas, bloating and cramps, and can eventually lead to such complaints as fatigue, headaches, memory loss, poor concentration and irritability. The set of symptoms known collectively as irritable bowel syndrome (IBS)—bloating and gas after eating and alternating constipation and diarrhea—has also been linked to leaky gut syndrome, as has the more serious inflammatory bowel disease.
Leaky gut has been associated with such cognitive dysfunctions as autism in children. It has been found that some autistic children seem to react to the MMR (measles, mumps, rubella) vaccine with inflammation in the gut lining. It is this inflammation that causes the gut to leak, allowing proteins such as gluten (from most grains) and casein (from milk) to enter the bloodstream, causing an allergic reaction to foods containing those proteins. (See the Autism section for more information.)

Once toxins enter the bloodstream through the leaky gut, their first stop is the liver. When the liver is called upon to work overtime due to toxic overload, toxins either re-circulate or are deposited in the liver or other places in the body. When they re-circulate to the intestines, they further irritate the lining, increasing its permeability. The recirculation of toxins can occur through the body's normal mechanism of entero-hepatic recirculation in which toxins go from liver to bile to intestines to the bloodstream and then back to the liver to start over. The food allergies and sensitivities that result from leaky gut create inflammation that causes the gut to leak even more. So, once leaky gut develops, it tends to become progressively worse if measures aren't taken to correct it.

How Is It Diagnosed?

The intestinal permeability assessment, which measures the absorption of mannitol and lactulose (two non-metabolized sugars), is described in the Appendix.

What Is the Standard Medical Treatment?

Since leaky gut syndrome is not a focus of conventional medicine, there really is no standard medical treatment. The conventional medical doctor will focus upon treating conditions that arise from leaky gut syndrome—and that treatment will likely be through use of drugs and/or surgery. Those nutritionally oriented physicians familiar with leaky gut will take a different approach, described, at least in part, at the end of this section.
Increased intestinal permeability, whether it is intermittent or chronic, may be a major contributing factor to most diseases. It has been well established that there are at least four factors that can lead to increased permeability:

1) Food allergies and sensitivities
2) Malnutrition
3) Dysbiosis (abnormal immune response to flora of low virulence or even normal flora)
4) Hepatic stress

(Please go to www.mdheal.org by Leo Galland, MD, for further details.)

From birth throughout life, maintaining a well-nourished intestinal lining and overlying mucus with beneficial bacteria is of paramount importance in controlling intestinal permeability. There is an excellent review article about this in the American Journal of Clinical Nutrition (Oct 2003, pages 675-683). This is a hallmark description of how mucus is made by the intestinal lining, how it is the gel layer of the mucus that allows for bacterial adhesion, how there is crosstalk between the bacteria and intestinal lining, and how these vibratory signals profoundly affect what type of immune response is elicited by the intestinal immune system. Suffice it to say that a balance of soluble and insoluble fiber, the right ratio of essential fatty acids, beneficial bacteria, digestive enzymes, and supplements for building and maintaining the gut lining would be a very wise dietary choice for everyone to make on a regular basis.
Leaky gut syndrome is the crux of all the conditions in this book. When the gut is imbalanced and inflamed, the integrity of the intestinal lining breaks down. This allows toxins, pathogens and undigested food particles to enter into the bloodstream which triggers an immune response involving yet more inflammation and a dysregulation of the immune system. All these factors contribute to the development of many different chronic diseases.

Leaky gut syndrome is a major part of the gut connection to so many health conditions that affect the rest of the body. I cannot stress enough the importance of rebuilding the gut lining. The gut lining needs to be intact so that the beneficial bacteria can adhere to it properly, creating the proper defense against invading pathogens and toxins, and being able to communicate with the immune system, which is connected to the gut lining. If this gut protection system is not in place, chronic and recurrent health conditions will develop.

Reducing toxic exposure is of prime importance in preventing and reversing leaky gut syndrome. Both exotoxins (from the outside environment) and endotoxins (produced inside the body by bacteria and poor digestive conditions) can contribute to leaky gut. Eliminating these toxins, maintaining regular elimination, and healing the intestinal lining are key steps in healing a leaky gut.

**Rule Out:**
- Candida overgrowth
- Parasitic infection
- Food sensitivity (See the Gluten Sensitivity and Allergies section.)
- Lactose intolerance (See the Lactose Intolerance section.)

**Recommended Testing**
- Comprehensive stool analysis (CSA) (See the Appendix.)
- Food sensitivity test (See the Appendix.)
- Intestinal permeability test (See the Appendix.)

**Diet**
- If Candida is an underlying condition, follow the Candida Diet. (See the Appendix.)
- For maintenance, follow the Fiber 35 Eating Plan. (See the Appendix.)

**Lifestyle**
- Avoid or minimize the use of NSAIDs (aspirin, ibuprofen, etc.) and antibiotics.
- Avoid use of antacids.
- Reduce toxic exposure to chemicals. Clean up your environment, and eat organic food as much as possible.

**Complementary Mind/Body therapies**
- Stress can be a major component of this disease, so find ways to reduce it with therapies such as meditation, yoga, deep breathing, massage, biofeedback, or music therapy.
- Acupuncture may be helpful as it targets the meridians associated with the digestive system, and it is also a stress reducer.
- Colon hydrotherapy may be beneficial to improve digestion and intestinal balance.