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 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)
- 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

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

- 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.
• 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 the leaky gut is the likely development of autoimmune disease where 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 that are 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

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

Did You Know

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

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 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.”

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 (which come from the outside environment) and endotoxins (which are 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 (See the Candidiasis section.)
• Parasitic infection (See the Parasitic Disease section.)

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.
<table>
<thead>
<tr>
<th>Recommended Nutraceuticals</th>
<th>Dosage</th>
<th>Benefit</th>
<th>Comments</th>
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<tbody>
<tr>
<td><strong>Critical Phase</strong></td>
<td>Daily maintenance recommendations should also be taken during this phase unless otherwise indicated.</td>
<td></td>
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<tr>
<td>L-Glutamine Powder with Gamma Oryzanol</td>
<td>10,000 mg daily divided doses</td>
<td>Helps repair the intestinal lining, reducing permeability and reducing severe reactions to foods.</td>
<td>Best taken in powder form.</td>
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<td><strong>Helpful</strong></td>
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<tr>
<td>Total Body Cleanse</td>
<td>See Appendix</td>
<td>Encourages elimination and detoxification.</td>
<td>Herbal formula should support the seven channels of elimination.</td>
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<tr>
<td>Bentonite clay / Glucomannan / Charcoal Formula</td>
<td>Use as directed</td>
<td>Helps absorb toxins from GI tract.</td>
<td>Short term, to be taken with plenty of water.</td>
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<tr>
<td>Antioxidant Supplement</td>
<td>Use as directed</td>
<td>Protects tissue from damage.</td>
<td>You can purchase a high potency antioxidant formulation from most health food stores.</td>
</tr>
<tr>
<td>High Potency Multi-vitamin/mineral</td>
<td>Use as directed</td>
<td>Provides needed nutrients that can be deficient with those with a leaky gut.</td>
<td>Powder or liquid formulation would be helpful as it is easier assimilated and absorbed.</td>
</tr>
<tr>
<td><strong>Daily Maintenance</strong></td>
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</tr>
<tr>
<td>L-Glutamine Powder with Gamma Oryzanol</td>
<td>5,000 mg daily in divided doses after critical phase</td>
<td>Helps repair the intestinal lining, reducing permeability and reducing severe reactions to foods.</td>
<td>Best taken in powder form.</td>
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<tr>
<td>Digestive Enzymes</td>
<td>Take with meals</td>
<td>Helps digest and absorb nutrients from food.</td>
<td>If low stomach acid is found find a formula that contains hydrochloric acid.</td>
</tr>
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<td>Probiotics</td>
<td>50 to 200 billion culture count daily</td>
<td>Numerous benefits to intestinal health, helps reduce permeability and inflammation.</td>
<td>Look for high amount of bifidobacteria, the main beneficial bacteria in colon.</td>
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<td>Omega-3 Fatty Acids</td>
<td>At least 2 grams daily of EPA/DHA combination</td>
<td>Helps restore moisture to the intestinal tract. Provides lubrication.</td>
<td>Look for a concentrated, enteric coated fish oil.</td>
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<tr>
<td>Fiber</td>
<td>4-5 grams twice daily</td>
<td>Helps produce healthy bacteria levels and good elimination.</td>
<td>Use in conjunction with high fiber diet to reach 35 g daily.</td>
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<tr>
<td>Vitamin D₃</td>
<td>At least 1,000 iu daily</td>
<td>Helps heal leaky gut, decrease inflammation, increase overall health.</td>
<td>Research is showing many health complications as a result of low vitamin D levels.</td>
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See further explanation of supplements in the Appendix