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Why Poor Gut Health Can Lead to Parkinson's and How to Avoid It

Analysis by Dr. Joseph Mercola | July 02, 2026

STORY AT-A-GLANCE

- Researchers found that Parkinson's-related changes in the gut microbiome appear years before diagnosis, and people whose gut bacteria most closely resembled the Parkinson's pattern showed more early warning signs such as constipation, mood changes, and subtle movement problems
- Beneficial bacteria that produce butyrate, a compound that helps maintain the intestinal barrier and supports gut-brain communication, declined as Parkinson's risk increased, while bacteria associated with inflammation became more abundant
- People with the most severe digestive dysfunction showed stronger signs of immune dysregulation, lower levels of protective compounds such as propionate, and evidence that gut inflammation may be actively involved in disease progression
- The Parkinson's microbiome produced lower amounts of vitamin B2, vitamin B7, short-chain fatty acids, and polyamines, suggesting that the gut loses some of its ability to generate compounds needed for energy production, intestinal health, and inflammation control
- Research suggests that supporting a healthy microbiome through a nutrient-dense diet rich in fruits and other whole foods, while avoiding ultraprocessed foods that disrupt gut health, helps create an environment that supports both gut and brain function

Parkinson's disease is the fastest-growing neurological disorder in the world.[1] Characterized by tremors, muscle stiffness, slowed movement, balance problems, and a long list of non-motor symptoms, it affects millions of people and often develops silently for years before a diagnosis is made.

By the time the condition becomes obvious enough to diagnose, researchers estimate that more than half of the brain's dopamine-producing neurons have already been lost. That sobering reality has fueled an urgent search for warning signs that appear much earlier, ideally while there's still something to protect.

For decades, that search focused almost entirely on the brain. But a growing body of evidence points somewhere unexpected: your gut. Long before the hallmark movement symptoms emerge, many people experience constipation, sleep disturbances, a fading sense of smell, mood changes, and other disruptions to the body's automatic functions.

These early clues raise the possibility that the disease process begins far from the brain — or that the brain's earliest changes ripple outward to the gut — and years before anyone notices a tremor. That raises a provocative question. If the gut begins to change long before Parkinson's becomes clinically obvious, how deeply is it involved in the disease itself, and could those changes reveal who is at risk while there's still time to act?

Your Gut Shows Warning Signs of Parkinson's Years Before Symptoms Appear

A study published in Nature Medicine investigated whether changes in gut bacteria could identify people moving toward **Parkinson's disease** before obvious symptoms appeared.[2] Researchers analyzed stool samples and clinical data from 271 people with Parkinson's disease, 43 people carrying high-risk GBA1 gene variants — the most common genetic risk factor for Parkinson's — who had not developed Parkinson's disease, and 150 healthy controls.

Their goal was to determine whether the gut contains clues that reveal who is progressing toward disease years before a diagnosis becomes possible.

- **About one-quarter of the gut microbiome shifted toward a Parkinson's-like state —** Researchers discovered that roughly 25% of the gut microbiome in symptom-free GBA1 carriers existed in an intermediate state between healthy individuals and people with Parkinson's disease.

  The closer a person's microbiome resembled the Parkinson's pattern, the more early warning signs they tended to show. Rather than appearing suddenly, the microbiome seemed to move through stages, suggesting that Parkinson's-related changes accumulate gradually over time.

- **People with the strongest microbiome changes showed the most early symptoms —** High-risk individuals whose gut bacteria most closely resembled those seen in Parkinson's disease reported more subtle movement problems and non-motor symptoms associated with the earliest stages of disease.

  These included autonomic dysfunction, which affects automatic body functions such as digestion, blood pressure regulation, and bladder control, along with other signs that often appear years before diagnosis. This finding is especially important because Parkinson's disease is typically diagnosed only after extensive neurological damage has already occurred.

- **Beneficial butyrate-producing bacteria declined as disease risk increased —** Researchers observed reductions in important bacteria from the Roseburia and Faecalibacterium groups. These microbes produce butyrate, a short-chain fatty acid (SCFA) that serves as a primary fuel source for cells lining the colon and helps maintain the intestinal barrier.

  When these bacteria decline, the gut loses some of its ability to regulate inflammation and maintain a healthy connection between the digestive system and the brain.

- **Inflammation-associated and oral bacteria became more abundant —** Several bacterial species increased as the microbiome shifted toward the Parkinson's pattern, including Streptococcus mutans, Bifidobacterium dentium, and Lactobacillus paragasseri.

  Researchers also found higher levels of Ruminococcus gnavus, a species frequently associated with inflammatory conditions. Some of these microbes normally reside in the mouth rather than the gut, suggesting that the microbial ecosystem becomes increasingly disrupted as disease progresses.

- **The microbiome closely reflected disease severity and progression —** Participants with the greatest microbiome disruption experienced worse **constipation**, more autonomic dysfunction, more depression, poorer cognitive function, and lower overall dietary quality scores than those whose microbiomes remained closer to normal. Researchers also determined that these microbial changes tracked with disease duration rather than Parkinson's medications.

  In other words, the microbiome appeared to evolve alongside the disease process itself. Individuals whose gut bacteria remained closest to the healthy pattern consistently showed better cognition, fewer digestive complaints, and a healthier overall clinical profile.

People with More Gut Problems Showed Stronger Signs of Immune Dysfunction

A study published in npj Parkinson's Disease examined immune cells, blood metabolites, and fecal metabolites in people with Parkinson's disease to better understand how gut dysfunction influences disease progression.[3] The researchers discovered two distinct groups.

One group had relatively few constipation-related symptoms, while the other showed significantly more gastrointestinal dysfunction. Although both groups had Parkinson's disease, their immune systems and gut-related biological markers looked very different,

suggesting that not all Parkinson's disease follows the same path.

- **People with worse gut symptoms showed a stronger inflammatory signature —** Participants with more gastrointestinal dysfunction had substantially higher levels of a type of immune cell associated with chronic inflammation. When levels remain elevated for long periods, inflammation becomes harder to control.

  Researchers found that these inflammation-promoting immune cells were especially abundant in participants with more constipation and digestive dysfunction, suggesting that gut inflammation and immune activation are closely connected in Parkinson's disease.

- **Important protective gut compounds were lower in participants with constipation —** Researchers found significantly lower levels of propionate in stool samples from participants with greater gastrointestinal dysfunction. Propionate is an SCFA produced when beneficial gut bacteria ferment carbohydrates.

  It helps maintain immune balance, supports intestinal health, and promotes tolerance rather than excessive inflammation. Lower propionate levels have also been observed in **inflammatory bowel disease** and chronic constipation, strengthening the link between microbial disruption and digestive dysfunction.

- **The microbiome appeared to shift away from healthy carbohydrate fermentation —** At the same time propionate levels fell, researchers observed higher levels of formate in stool samples. This finding suggests that microbial metabolism had shifted away from fermenting carbohydrates and toward fermenting proteins.

  That change is commonly seen in chronically constipated and dysbiotic guts. Dysbiosis simply means the balance of microorganisms in the digestive tract has become disrupted. Over time, this altered microbial activity creates a less favorable environment for both gut and immune health.

- **Several immune cells appeared to migrate toward inflamed gut tissue —** Participants with more digestive dysfunction had lower levels of specific gut-homing immune cells circulating in their blood. Researchers believe this reduction could indicate that these cells had moved into inflamed intestinal tissue instead.

  They also found evidence of altered MAIT cells and T cells, specialized immune cells that help monitor the intestinal environment and respond to microbial activity. Together, these findings suggest that immune activity in the gut becomes increasingly abnormal as gastrointestinal symptoms worsen.

- **A metabolic marker linked inflammation to immune dysfunction —** One of the most intriguing findings involved succinate, a molecule produced during cellular energy metabolism. Researchers found that some participants had markedly elevated blood levels of succinate, and these individuals also displayed stronger pro-inflammatory immune responses.

  Succinate tends to accumulate during chronic inflammatory stress and can reinforce inflammatory signaling in a self-perpetuating cycle. The study identified what researchers described as a metabolic-immune connection, suggesting that disruptions in energy metabolism, gut health, and immune function are all intertwined in Parkinson's disease.

  Researchers concluded that differences in immune activity, gut symptoms, and microbial metabolism may help explain why some people develop a more gut-centered form of Parkinson's disease while others follow a different trajectory. The study provides evidence that gastrointestinal dysfunction is not simply a side effect of Parkinson's disease. Instead, it appears deeply woven into the biological processes that shape how the disease develops and progresses.

The Parkinson's Microbiome Lost Its Ability to Produce Protective Nutrients and Metabolites

A separate study published in npj Parkinson's Disease combined data from 94 Parkinson's patients and 73 controls in Japan with five additional datasets from the U.S., Germany, China, and Taiwan, creating one of the largest international analyses of the Parkinson's microbiome to date.[4] Despite major differences in diet, geography, and microbial composition between countries, the researchers found remarkably consistent patterns.

The most important changes were not simply which bacteria were present or absent, but what the microbiome had lost the ability to produce.

- **The strongest microbial deficit involved two important B vitamins —** Across all six datasets, genes involved in the production of riboflavin (vitamin B2) and biotin (vitamin B7) were among the most consistently reduced biological pathways in Parkinson's disease. **Riboflavin** helps support mitochondrial function, energy production, antioxidant defenses, and healthy nervous system activity.

  Biotin helps regulate inflammation and supports numerous metabolic processes throughout the body. The researchers found that reductions in these vitamin-producing pathways remained significant even after accounting for factors such as age, body weight, sex, and constipation.

- **The microbiome became less capable of turning food into beneficial compounds —** Researchers found widespread reductions in carbohydrate-active enzymes, often called CAZymes, which are specialized microbial tools that break down dietary fibers and other complex carbohydrates.

  Five of six major CAZyme categories were significantly lower in Parkinson's disease. In simple terms, the gut microbiome appeared less efficient at converting food into substances that support intestinal health. This finding suggests that Parkinson's disease is associated not only with different bacteria but also with a loss of important microbial functions.

- **Levels of several protective gut metabolites dropped sharply —** When researchers directly measured stool samples, they found significant reductions in acetate, propionate, and butyrate, three SCFAs produced by beneficial gut bacteria. These compounds help nourish cells lining the intestine, regulate immune activity, and support communication between the gut and brain.

  The study also found lower levels of putrescine, spermidine, and spermine, a group of compounds known as polyamines. Polyamines help maintain intestinal barrier integrity, support cellular repair, and regulate inflammation. Together, these findings suggest that the Parkinson's microbiome produces fewer of the compounds needed to keep the gut healthy and resilient.

- **The loss of vitamins was closely linked to the loss of protective metabolites —** Reductions in riboflavin- and biotin-producing genes closely tracked with reductions in SCFAs and polyamines. Researchers found positive correlations between these pathways across multiple analyses, suggesting that these changes are biologically connected rather than independent events.

  Previous research cited by the authors showed that riboflavin helps support butyrate production and that low riboflavin status can reduce levels of beneficial microbial metabolites. The findings point to a cascading effect in which microbial dysfunction leads to nutrient deficits, which then reduce production of compounds that protect the intestinal environment.

- **Researchers proposed a pathway linking gut dysfunction to Parkinson's disease progression —** Based on their findings and prior research, the researchers proposed that lower levels of SCFAs and polyamines weaken the protective mucus layer lining the intestine. A thinner mucus layer increases intestinal permeability, sometimes referred to as a "leaky gut," allowing toxins and other harmful substances easier access to intestinal tissues.

The researchers suggest that this environment promotes abnormal accumulation of alpha-synuclein, the protein that forms the characteristic clumps found in Parkinson's disease, while also increasing neuroinflammation. Their model places gut dysfunction near the beginning of the disease process and identifies microbial production of vitamin B2, vitamin B7, SCFAs, and polyamines as important factors in maintaining both gut and brain health.

- **Researchers and clinicians are already translating these gut findings into practical strategies —** In an article discussing the latest Parkinson's research, Professor K. Ray Chaudhuri of University College London noted that people with Parkinson's disease tend to have fewer beneficial bacteria such as Faecalibacterium, Prevotella, and Roseburia, while unhealthy dietary patterns are associated with microbiome changes linked to the disease.[5]

  He also highlighted evidence connecting Mediterranean-style diets, flavonoid-rich foods, and probiotics with improved gut health and better symptom management. These observations reinforce a central theme emerging from the research: supporting the microbiome is not just about digestion; it is increasingly viewed as an important part of protecting brain health and slowing the processes associated with Parkinson's disease.

Support Your Gut to Protect Your Brain

The research shows that people with the healthiest gut microbiomes consistently showed fewer Parkinson's-related warning signs. While no single food or habit determines your future, your daily choices shape the bacterial ecosystem inside your digestive tract. To protect your brain health for the long term, start by improving the environment that beneficial gut bacteria need to thrive.

1. **Feed beneficial bacteria with well-tolerated whole-food carbohydrates —** Your gut bacteria depend on carbohydrates that reach the colon. If your digestion is healthy, focus on whole fruits, root vegetables, and other minimally processed carbohydrate

sources. Aim for around 250 grams of healthy carbohydrates each day so your cells have enough fuel to produce energy efficiently.

If you have a damaged gut and struggle with fiber, start slowly with easier-to-digest foods like fruit and white rice, and gradually expand variety. As your gut heals, beneficial bacteria produce butyrate that strengthens your intestinal barrier, helps regulate inflammation, and supports communication between your gut and brain. The goal is to create an environment where these beneficial bacteria can thrive and help restore a healthier microbiome.

2. **Increase the diversity of plant foods you eat —** The studies found links between healthier dietary patterns and healthier microbiome profiles. Instead of eating the same few foods every week, challenge yourself to add more variety. Different plants feed different bacterial species.

   Berries, citrus fruits, herbs, cooked vegetables, and seasonal produce all contribute unique compounds that help support a more resilient microbial ecosystem. You can also add **fermented foods** such as yogurt, kefir, sauerkraut, and kimchi, which supply live bacteria and the compounds they produce — a gentle way to reintroduce microbial diversity alongside the fiber that feeds it.

3. **Eliminate foods that disrupt gut health —** One of the fastest ways to improve your microbiome is to stop feeding the bacteria you don't want. Remove seed oils high in **linoleic acid** (LA), ultraprocessed foods, packaged snacks, fast food, and heavily processed convenience meals. These foods are low in the fibers beneficial bacteria depend on, contribute to inflammation, and undermine cellular energy production.

   I also recommend avoiding nuts and seeds because of their high LA content. Replace industrial fats with tallow, ghee, or grass fed butter.

4. **Support cellular energy production every day —** Brain health depends on cellular energy. Prioritize regular movement, daily sunlight exposure, and adequate protein intake. Aim for about 0.8 grams of protein per pound (or 1.76 grams per kilogram) of lean body mass, with roughly one-third coming from collagen-rich sources.

Morning sunlight helps regulate circadian rhythms, supports mitochondrial function, and promotes the biological processes that keep both your gut and brain functioning properly.

5. **Track early warning signs instead of waiting for major symptoms —** Constipation, reduced sense of smell, mood changes, sleep disturbances, and changes in autonomic function often appear years before Parkinson's disease receives a diagnosis. Treat these changes as valuable feedback rather than inconveniences. Think of them as dashboard lights.

   The earlier you notice them, the more opportunity you have to improve the factors that influence gut health, metabolic health, and long-term brain function.

FAQs About Gut Health and Parkinson's Disease

Q: How is gut health connected to Parkinson's disease?

A: Research suggests that changes in the gut microbiome occur years before the hallmark movement symptoms of Parkinson's disease appear. People whose gut bacteria most closely resembled the Parkinson's pattern showed more early warning signs, including constipation, mood changes, autonomic dysfunction, and subtle movement difficulties. Scientists increasingly believe that gut dysfunction is involved in the disease process itself rather than simply being a side effect.

Q: Which gut bacteria are reduced in Parkinson's disease?

A: Several beneficial bacteria consistently decline in Parkinson's disease, including Roseburia, Faecalibacterium, and Prevotella. These microbes help produce SCFAs such as butyrate, which support the intestinal barrier, regulate inflammation, and promote healthy communication between your gut and brain. Lower levels of these bacteria are associated with worse symptoms and greater microbiome disruption.

Q: What nutrients and compounds does the Parkinson's microbiome produce less of?

A: Studies found that the Parkinson's microbiome produces lower amounts of riboflavin (vitamin B2), biotin (vitamin B7), SCFAs, and polyamines. These compounds support energy production, intestinal barrier function, immune regulation, and cellular repair. Researchers believe that losing these protective substances contributes to inflammation, intestinal permeability, and disease progression.

Q: What dietary pattern is associated with a healthier Parkinson's-related microbiome?

A: Research highlighted healthier microbiome profiles among people who consumed more fruits, vegetables, and other minimally processed foods. Mediterranean-style eating patterns and flavonoid-rich foods such as berries, apples, and tea have also been associated with better gut health and improved symptom management. In contrast, diets high in ultraprocessed foods were linked to microbiome changes associated with Parkinson's disease.

Q: What are some of the earliest warning signs of Parkinson's disease?

A: Constipation is one of the most common early warning signs and often appears years before diagnosis. Other early symptoms include reduced sense of smell, sleep disturbances, depression, anxiety, and problems involving your body's automatic functions, such as blood pressure regulation and bladder control. These symptoms frequently emerge long before tremors or movement problems become noticeable.

Sources and References

- [1, 5] The Telegraph May 26, 2026
- [2] Nature Medicine April 20, 2026
- [3] npj Parkinson's Disease December 20, 2025
- [4] npj Parkinson's Disease May 21, 2024