

Probiotics Improve Long COVID

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STORY AT-A-GLANCE

- › Probiotics reduced muscle fatigue and brain fog, two symptoms of long COVID, after only 14 days; this may have a significant impact on the nearly 12 million people who experience long COVID symptoms
- › Poor gut microbiome diversity also predicts greater severity of COVID-19; some health experts recommend postbiotics in the prevention and treatment of COVID
- › Your gut health affects your neurological health; a poor gut microbiome can increase the risk of gut permeability, Alzheimer's and other dementias
- › Factors that affect the health of your gut microbiome include artificial sweeteners, sleep, exposure to sunlight and the types of foods you eat

As reported in this short news clip, research evidence¹ shows that probiotics may help reduce long-haul symptoms after COVID-19. Some people experience symptoms for weeks or months after a COVID-19 infection has resolved. When these symptoms persist for four weeks or more, they are known as long COVID, long-haul COVID, chronic COVID or long-haul syndrome.

Many of the symptoms of long COVID can also mirror those that are caused by the COVID-19 genetic therapy injections. Although anyone can experience symptoms of long COVID, it is more frequently seen in people who have been sick enough to be hospitalized or in the ICU.

According to Dr. Peter McCullough, board-certified internist and cardiologist, 50% of those who have been sick enough to be hospitalized will have symptoms of long COVID:²

“So, the sicker someone is, and the longer the duration of COVID, the more likely they are to have long COVID syndrome. That’s the reason why we like early treatment. We shorten the duration of symptoms and there’s less of a chance for long COVID syndrome.”

Symptoms of long COVID include fatigue, shortness of breath, coughing, chest pain, joint pain, memory problems, loss of taste or smell and muscle pain or headache.³ The symptoms are the result of damage to the lungs, immune system, mitochondria, heart and nervous system. McCullough goes on to explain that after a severe case of COVID-19, blood clots and heart problems can happen for up to 90 days or more.

Inflammation to the lining of the heart – pericarditis – and around the lining of the lungs – pleuritis – can also occur in long COVID. Data from a study⁴ published in November 2021 show the administration of probiotics can affect the gut microbiome, and subsequently help your body heal from the symptoms of long COVID.

Data Show Probiotics Help Long-Haul COVID Symptoms

Roughly 12 million people may suffer from long COVID symptoms, which a Swedish study found could potentially be alleviated after 14 days of probiotics.⁵ The study was published September 2021 in the journal *Medicines*.⁶ The researchers wanted to evaluate how effective probiotics might be in alleviating two of the symptoms of long COVID – muscle soreness and brain fog.

They enrolled 200 patients who had complaints of muscle fatigue after COVID. One hundred participants received a placebo and 100 received a combination of ImmunoSEB (systemic enzyme complex) and ProbioSEB CSC3 (probiotic complex). The participants were tested at different time points from Day 1 to Day 14.

The data showed that those treated with the supplements had 91% resolution of muscle fatigue by Day 14. There was also a greater reduction in mental fatigue scores as compared to those receiving the placebo. The researchers concluded:⁷

“This study demonstrates that a 14 days supplementation of ImmunoSEB + ProbioSEB CSC3 resolves post-COVID-19 fatigue and can improve patients’ functional status and quality of life.”

ABC News interviewed public health medical educator Dr. Shad Marvasti, who recommends using probiotic supplements with at least 10 strains of active cultures to help support the immune system.⁸ He noted fermented foods such as sauerkraut, miso, kimchi and tempeh would help populate your gut microbiome.

He also mentions yogurt. However, I recommend that if you do use yogurt, it's homemade since the products sold in the grocery store are high in sugar, which is a nutrient that feeds harmful bacteria in the gut. Also, if you decide to eat fermented soy, to be sure it's grown organically, as most soy in the U.S. is a GMO food that is contaminated with pesticides and herbicides.

During data-gathering for the research, the scientists found other coronavirus infections, such as SARS, also triggered long-term symptoms. During follow-up, data showed 64% reported muscle fatigue at three months, 54% at six months and muscle fatigue at 12 months in 60% of those surveyed.⁹ Likewise, after the Middle East Respiratory Syndrome (MERS), 48% reported fatigue after 12 months.

The researchers believe that the supplement regimen used on the participants reduced physical and mental fatigue and would be an effective early intervention. They suggest that while scientists continue to characterize long haul syndrome, these dietary supplements are added to clinical recommendations to help improve functional status and quality of life.¹⁰

Poor Gut Health May Predict Severe COVID

In an unrelated study published in 2018, researchers performed a systematic review of 70 randomized placebo-controlled trials¹¹ to evaluate how specific probiotics may benefit individuals who had irritable bowel syndrome or other gastrointestinal (GI) disturbances. The data from the review indicated that there were specific probiotics with beneficial effects on lower GI health conditions, such as irritable bowel syndrome.

Knowledge that probiotics offer a distinct advantage to the immune system has prompted study into the relationship between gut health and COVID outcomes. The featured study was published in the same month and year as another paper¹² that proposed the use of postbiotics in the treatment of post-COVID long-haul symptoms.

The writers advocate postbiotics that may help alleviate the burden on the body from viral infections and they postulate there may be a role for “precision postbiotics” in preventive interventions. Postbiotic is an umbrella term for components of microbial fermentation.¹³ This can include short-chain fatty acids, functional proteins, metabolites and extracellular polysaccharides.

Since the start of the pandemic, several studies have shown that patients with GI symptoms often have more severe disease. One review of more than 1,000 patient records was presented to the American College of Gastroenterology.¹⁴ The data showed those who presented at admission with GI symptoms and suspected COVID-19 infection had worse outcomes than those who did not have GI symptoms.

After adjusting for comorbidities, demographics and other clinical symptoms, of 1,000 patients, 22.4% had at least one GI symptom, the most common of which was nausea and vomiting. Researchers also found those who had GI symptoms had a higher body mass index, a higher prevalence of diabetes and high blood pressure, and were older.

While this group had a higher rate of ICU admission and intubation, the study did not include mortality rates in the analysis. However, SciTech Daily¹⁵ reported that autopsy results and studies have suggested a sizable number of people with severe COVID-19 also have GI problems. A significant number of people with respiratory problems also had GI symptoms, suggesting that when the virus affects the GI tract, it can increase the severity of the illness.

Another paper¹⁶ published in January 2021 suggested the GI symptoms that predict severe COVID-19 are triggered by poor gut health. The writer, Heenam Stanley Kim, Ph.D., from Korea University, proposes that gut dysbiosis can exacerbate the severity of the infection.

This hypothesis is supported by a review of several studies since the start of the pandemic, which also demonstrated an association between severe disease and a lack of microbial diversity.¹⁷ An early study of patients admitted from March 4, 2020, to March 24, 2020, showed 31.9% had GI symptoms on admission.¹⁸

Your Gut Affects Brain Health and Immunity

Your gut health plays an important role in your neurological health and with your immune system. A very large part of your immune system sits in your gut microbiome and GI tract. Researchers estimate that up to 80% of your immune cells can be found in the gut.¹⁹

The complex interaction between your gut microbiome, pathogens and your immune system is affected by several factors, including your nutrition. One review of the research²⁰ published in 2021 identified the significance that nutrition plays in both prevention and treatment of infectious disease.

There are also deep connections that exist between your gut and your brain. Harvard Health²¹ explains that these two structures are linked through biochemical signaling. The primary connection is the vagus nerve, which is the longest nerve in the body.

For example, when the fight-or-flight response is triggered, warning signals are sent to the gut. This is why digestive problems can be triggered by a stressful event. On the other hand, digestive issues like irritable bowel syndrome or chronic constipation can trigger anxiety or depression.

Alzheimer's disease continues to be a leading cause of death in the U.S., with 1 in 3 seniors dying with Alzheimer's or dementia – more than the number killed by breast and prostate cancers combined.²²

One team of Swiss and Italian researchers found a connection between imbalanced gut microbiota and the development of amyloid plaques in the brain, associated with Alzheimer's disease.²³ In a prior study²⁴ the team had found that the gut microbiota in people with Alzheimer's disease is different from those without the condition; microbial diversity is reduced, and certain bacteria are overrepresented.

In their current study, the researchers engaged 89 people aged 65 to 85 years. Some were diagnosed with Alzheimer's disease or other neurodegenerative diseases and the others were healthy with no memory problems. The researchers used PET imaging to measure amyloid deposits in the brain and measure the serum markers of inflammation and proteins produced by intestinal bacteria.

"Our results are indisputable: Certain bacterial products of the intestinal microbiota are correlated with the quantity of amyloid plaques in the brain," explained Moira Marizzoni, one study author with the Fatebenefratelli Center in Brescia, Italy.²⁵

The Effects of Artificial Sweeteners, Sleep and Sunlight

Several factors influence your gut microbiome. One factor found in many processed foods that has a devastating effect on your gut microbiome is artificial sweeteners. As early as 2008,²⁶ scientists had discovered that sucralose lowered your gut bacteria count by 47.4% to 79.7% and increased the pH level of your intestines.

More recently, scientists found that three of the most popular artificial sweeteners – sucralose (Splenda), aspartame (NutraSweet, Equal and Sugar Twin) and saccharin (Sweet'n Low, Necta Sweet and Sweet Twin) – have a pathogenic effect on two types of gut bacteria.²⁷

Lab data demonstrated the products can trigger beneficial bacteria to become pathogenic and potentially increase your risk of serious health conditions. This was the first study to demonstrate how two types of beneficial bacteria can become diseased and invade the gut wall. The bacteria studied were *Escherichia coli* (*E. coli*) and *Enterococcus faecalis* (*E. faecalis*).

This research supports past evidence that noncaloric artificial sweeteners induced “compositional and functional alterations” in the gut microbiome.²⁸ Data have also shown that artificial sweeteners can increase the permeability of the intestinal epithelial barrier, which leads to systemic inflammatory diseases. In the lab,²⁹ high concentrations of aspartame and saccharin induced cell death and at low concentrations, it increased the epithelial permeability.

Two strategies that also play a role in your gut microbiome are getting more sleep and sunshine. Researchers have found a curious bidirectional link between your gut health and sleep. One study published in the *Frontiers of Psychiatry* noted:³⁰

“There is considerable evidence showing that the gut microbiome not only affects the digestive, metabolic, and immune functions of the host but also regulates host sleep and mental states through the microbiome-gut-brain axis.

Preliminary evidence indicates that microorganisms and circadian genes can interact with each other. The characteristics of the gastrointestinal microbiome and metabolism are related to the host's sleep and circadian rhythm.”

As noted in the *Frontiers in Psychiatry* study,³¹ mounting research suggests your gut microbiome helps regulate not only your mood but also your sleep cycle through what's known as the gut-brain axis — a bidirectional communication “highway” that links your central and enteric nervous systems.³²

During the past pandemic months, it has become increasingly obvious that maintaining optimal levels of vitamin D could help reduce your risk of infectious disease.³³ A research team from the University of British Columbia was also interested in how exposure to UVB light may affect the human gut microbiome.³⁴

Past studies had suggested vitamin D could alter the gut microbiome³⁵ and since there are few natural foods that contain vitamin D,³⁶ a vast majority of your body's requirement is usually met through skin exposure to UVB light.³⁷

The researchers from British Columbia noted that past research has shown sunlight has a positive effect on those with inflammatory bowel disease and multiple sclerosis, both of which are exacerbated by inflammation.³⁸ In this clinical pilot study the researchers found the fecal microbiota were positively altered after exposure to sunshine. They wrote:³⁹

“This is the first study to show that humans with low 25(OH)D serum levels display overt changes in their intestinal microbiome in response to NB-UVB skin exposure and increases in 25(OH)D levels, suggesting the existence of a novel skin-gut axis that could be used to promote intestinal homeostasis and health.”

Optimize Your Gut Microbiome

The choices you make every day have an impact on your gut microbiome. Optimizing your gut flora and vitamin D level is crucial to good health. Regularly eating traditionally fermented and cultured foods is the easiest, most effective and least expensive way to make a significant impact on your gut microbiome.

Healthy choices include lassi (an Indian yogurt drink), cultured grass-fed organic milk products such as kefir and yogurt, natto (fermented soy) and fermented vegetables of all kinds. Generally, I believe the majority of your nutrients need to come from food. However, supplemental probiotics are an exception if you don't eat fermented food on a regular basis. Spore-based probiotics, or sporebiotics, can be helpful if antibiotics are necessary.

In addition to getting enough quality sleep and maintaining optimal levels of vitamin D, it is also important to feed your beneficial bacteria the nutrients they need to thrive. While harmful bacteria thrive on sugar and carbohydrates, beneficial bacteria thrive on fiber.

According to a study published in 2019 in *The Lancet*⁴⁰ people eating 25 to 29 grams of fiber each day had a reduced risk of a range of critical outcomes, such as stroke, coronary heart disease, Type 2 diabetes and all-cause mortality. However, they found eating 29 grams a day was merely adequate, writing:⁴¹

"Dose-response curves suggested that higher intakes of dietary fiber could confer even greater benefit to protect against cardiovascular diseases, Type 2 diabetes, and colorectal and breast cancer."

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