



Long-Haul COVID

What Is Long-Haul COVID?

Long COVID, also known as long-haul COVID, chronic COVID or long-haul syndrome, refers to symptoms that persist for four or more weeks after an initial COVID-19 infection. This condition can affect people of all ages, otherwise healthy people, and those with other underlying health conditions. It has been seen in those who were hospitalized with COVID-19 and patients with very mild symptoms. Studies indicate that about 10% of people infected with COVID-19 will experience long-haul symptoms.

Symptoms of Long-Haul COVID

Common Symptoms of Long COVID Signs and symptoms of long COVID, which persist for four weeks or more after you've been diagnosed with COVID-19, include:

- Fatigue
- Shortness of Breath or Difficulty Breathing
- Cough
- Joint Pain
- Chest Pain
- Memory, Concentration or Sleep Problems
- Muscle Pain
- Headache
- Fast or Pounding Heartbeat
- Loss of Smell or Taste
- Depression or Anxiety
- Fever
- Dizziness When You Stand
- Worsened Symptoms After Physical or Mental Activities

Symptoms Can Be As The Result of Damage of Multiple Body Systems:

Pulmonary/Lungs Immune/Allergy Mitochondria/Energy System Heart Central/Peripheral Nervous System

Blood Clots

Blood clots can occur as the result of having had COVID-19 particularly in those who had a severe case. Blood clots, heart problems, and heart attack can occur for 90 days post-Covid due to remnants of the virus remaining in the nervous system, heart, lungs, and other organs.

Symptoms of a Blood Clot

- Shortness of Breath
- Cough With Blood
- Pain On One Side With Deep Breath

These symptoms could be due to a late pulmonary embolism or a blood clot going to the lungs. If you have these symptoms, you should be thoroughly evaluated by your healthcare provider or ER.

Heart Problems

Pericarditis, inflammation around the heart and pleuritis, inflammation of the lining of the lungs may also occur in long-haul COVID. This occurs when inflammation is triggered by the virus and the spike protein is still present. There is added risk for heart attack or stroke in long COVID especially for those individuals with a heart stent or carotid stenosis.

Neurological Syndromes

Neurologic syndromes in long COVID can occur though the scope is still unknown. Symptoms include joint and muscle pain, headaches, brain fog and tinnitus (ringing in the ears). Some people also have changes in the autonomic nervous system, such as elevated heart rate, and sensory neuropathies, including numbness and weakness in the legs.

Chronic Fatigue

Chronic fatigue is a major problem for many with long-haul COVID as are sleep disturbances. In addition to avoiding stimulants such as caffeine and alcohol, The Front Line COVID-19 Critical Care Working Group (FLCCC) has a management protocol – I-RECOVER – for long haul COVID-19 syndrome that includes melatonin, which can also help with sleep disturbances.

Healthy Gut Microbiome

Your microbiome plays an important role in COVID-19 and having a healthy microbiome can help protect against developing COVID-19. Bifidobacterium, a healthy bacteria found in the gut, appear to fight off COVID-19. SARS-CoV-2 is introduced to your GI tract via your nose and mouth when swallowed and survives longer in the lower GI tract than your respiratory tract. Therefore it is important to support your gut and digestive system by avoiding sugar and processed foods that increase inflammation and focus on a diet of clean, organic foods and taking a high-quality probiotic. Avoid unnecessary use of antibiotics as well.

SARS-CoV-2 attaches to the GI tract via the ACE-2 receptor. There are a number of the ACE-2 receptors in the GI tract. If you have persistent symptoms post-COVID this could indicate you have poor gut microbiome and possibly leaky gut.

Consider Additional Testing

Cytokine InCellKINE test to assess long hauler index profile prior to initiating or can consider initiating empirically. This tests a number of inflammatory cytokines in the body that can be elevated post-COVID and may help guide treatment.

First-Line Treatment FLCCC I-Recover Protocol

Ivermectin: 0.2mg/kg body weight. Twice daily for 1 week. Discontinue after 2 - 4 weeks if all symptoms have resolved an extended course of treatment may be necessary. The anti-inflammatory properties of ivermectin may mediate this benefit. **Prednisone:** 10-15mg daily for 3 weeks. Taper to 10mg for three days, then 5mg for three days and then stop. **Low dose naltrexone (LDN):** Begin with 1.5mg daily and increase to 4.5mg as required. May take 2-3 months for full effect.

Omega-3 fatty acids: DHA/EPA 4g per day. Omega-3 fatty acids play an important role in the resolution of inflammation by inducing resolving production. **Vitamin D:** The majority of those with post-COVID-19 syndrome continue to have low vitamin D levels.

Second-Line Therapy

Fluvoxamine (low dose): 25mg once daily. Stop if the symptoms increase. Caution with the use of other antidepressants and psychiatric drugs. Taper and discontinue once symptoms improve. **Atorvastatin:** 20-40mg once daily. Caution in patients with Postural Orthostatic Tachycardia Syndrome (POTS); may exacerbate symptoms.

Adjunctive Therapies

- **Curcumin:** 500mg BID (has anti-inflammatory and immunomodulating properties and has been demonstrated to re-polarize macrophages).
- **Nigella Sativa:** 40mg/kg/day (1 tsp = 3.3grams)-like **Curcumin** it has anti-inflammatory and immunomodulating properties.
- **Vitamin C:** 500mg BID (Vitamin C inhibits histamine & re-polarizes monocytes).
- **Melatonin:** 2-8mg at night (slow-release/extended-release) with attention to sleep hygiene. Increase dose from 1mg as tolerated (may cause severe nightmares at high dosages).
- **Kefir, Probiotic Yogurt and/or Bifidobacterium Probiotics** (e.g., Daily Body Restore) together with **Prebiotics** (e.g. XOS Prebiotic, Bio Nutrition Pre-Biotic) to normalize the microbiome. Prolonged dysbiosis has been reported following COVID-19 infection.
- **Behavioral Modification, Mindfulness Therapy & Psychological Support** may help improve survivors' overall well-being and mental health.
- **Luteolin** 100-200mg day or **Quercetin** 250mg day (or mixed flavonoids). **Luteolin** and **Quercetin** have broad spectrum anti-inflammatory properties. These natural flavonoids inhibit mast cells and have been demonstrated to reduce neuroinflammation.
- **H1 Receptor Blockers** (for mast cell activation syndrome): **Loratadine** 10mg daily, or **Cetirizine** 5-10mg daily, or **Fexofenadine** 180mg – daily.
- **H2 Receptor Blockers** (for mast cell activation syndrome-MCAS): **Famotidine** 20-40mg, or **Nizatidine** 150mg – twice daily as tolerated.
- **Montelukast:** 10mg/day (for mast cell activation syndrome-MCAS). Caution as may cause depression in some patients.
- **Anti-androgen Therapy: Spironolactone** 50-100mg twice a day, and **Dutasteride** 1mg daily.

Much research is being done on long COVID, however there are no proven treatments.