

Chronic Viruses & Post-Viral Syndrome

Viral illness is unavoidable. The typical course is an acute and uncomfortable period followed by a quick return to health. But for a certain segment of the population, the immune system is not able to mount a fully effective response, resulting in chronic infection. Chronic viruses establish lifelong latency, where they remain dormant, or can opportunistically reactivate when the host's system is under stress. This can further weaken the immune system, leaving it susceptible to other infections – both new exposures and those existing in a dormant state.

Post-Viral Syndrome Defined

Also known as myalgic encephalomyelitis or post-viral fatigue syndrome, post-viral syndrome is a common disorder that follows chronic viral infections. It presents as exhaustion, fatigue, muscle aches and pains, shortness of breath, sleep disturbances, cognitive dysfunction, and depression, and can include a wide range of other symptoms.¹ Women are affected up to 10 times more often than men.² Following a viral infection, the patient may recover completely or experience symptoms that follow a relapsing and remitting course. Or the viral infection may result in chronic illness.³

Symptoms that persist beyond four weeks from the initial onset of symptoms have come to define the post-viral or long-haul syndrome. Some of the pathophysiologic mechanisms include direct viral toxicity, endothelial damage and microvascular injury, immune system dysregulation and a hyperinflammatory state, and hypercoagulability with thrombosis.⁴

Epidemiology/Physiology

A virus is an infectious microorganism that rapidly replicates inside a living cell, producing thousands of copies. These viruses are often asymptomatic when dormant. But the presence of these stealth pathogens may lead to an array of systemic symptoms and immune dysregulation, detectable by serum antibody testing showing persistent, low-grade titers or elevated titers indicating reactivation of the virus. Serum antibody testing is an indirect method for viral detection, and other modalities for testing may be considered. Chronic viral illness, regardless of the specific pathogen, increases inflammation and can present with many similar symptoms ranging from low-grade to significant. Common symptoms include:

- Fatigue
- Headache
- Fever
- Malaise
- Irritability
- Sore throat
- Lymphadenopathy

¹ Behan PO, Behan WM. Postviral fatigue syndrome. *Crit Rev Neurobiol.* 1988;4(2):157-178.

² Archer MI. The post-viral fatigue syndrome: A review. *Journal of the Royal College of General Practitioners.* 1987; 37: 212-214

³ Taur Y, Pamer EG. The intestinal microbiota and susceptibility to infection in immunocompromised patients. *Curr Opin Infect Dis.* 2013 Aug;26(4):332-7. doi: 10.1097/QCO.0b013e3283630dd3. PMID: 23806896; PMCID: PMC4485384.

⁴ Nalbandian A et al. Post-acute COVID-19 syndrome. *Nature Medicine.* 2021; 27(4): 601-615

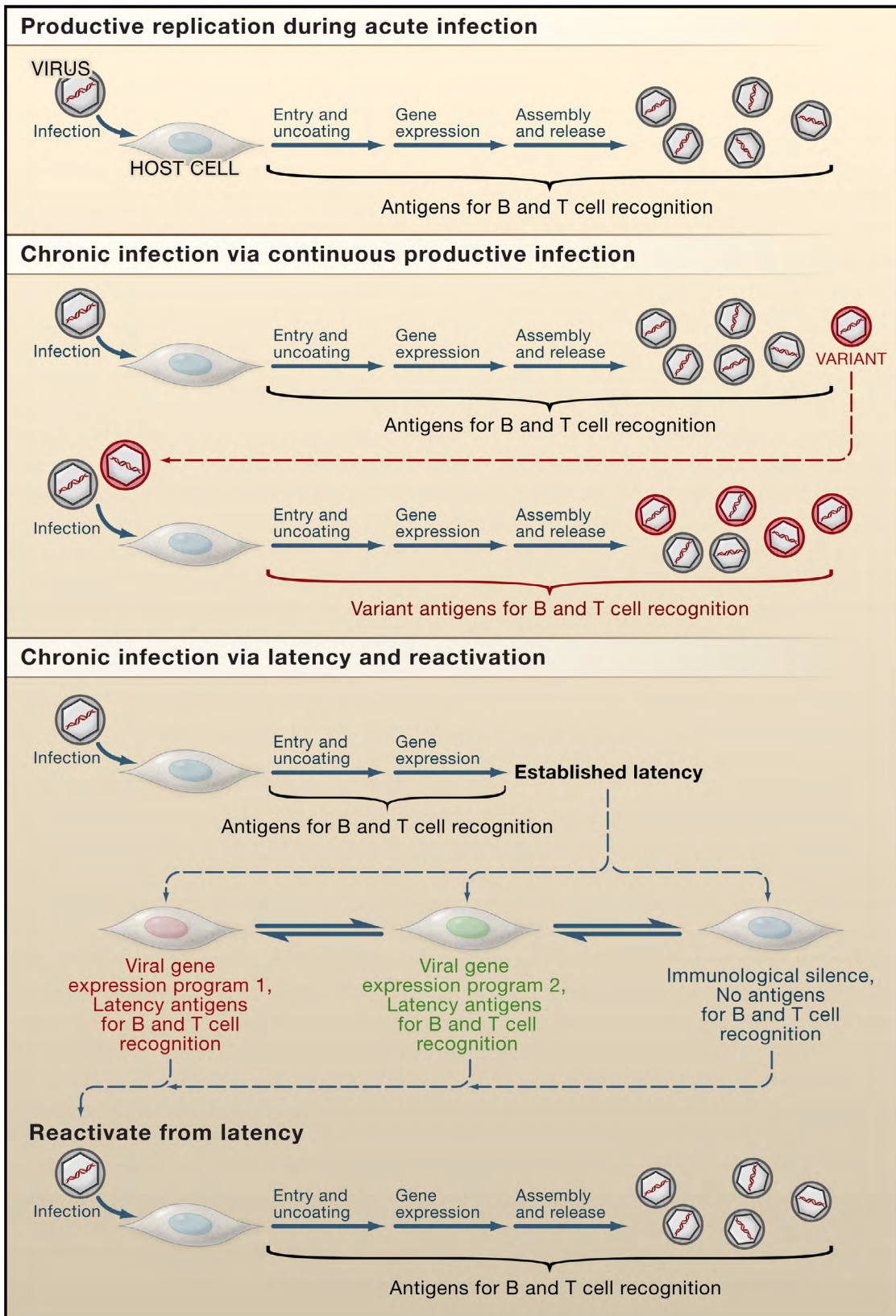


Figure 1. <https://www.cell.com/fulltext/S0092-8674%2809%2900783-1>

THE MOST COMMON CHRONIC VIRUSES ARE MEMBERS OF THE HERPESVIRUS FAMILY⁵

Virus	Transmission	Prevalence	Chronic Presentation	Complications
Epstein Barr Virus/ Cytomegalovirus (EBV/CMV) Acute infection is infectious mononucleosis	Primarily from saliva. Also through: <ul style="list-style-type: none"> • blood transfusion • stem cell and organ transplantation⁶ 	Affects 60-95% ⁷ of adults.	Can be asymptomatic or systemic, manifesting as: hepatosplenomegaly, lymphadenopathy, headache, malaise, fever, and sore throat. ⁸ Symptoms can last months to years. Lingering fatigue is the most common complaint.	Opportunistic infections can cause organ damage in immunocompromised patients, leading to conditions such as hepatitis, pneumonitis, and colitis ⁹
Human Herpes Virus 6 (HHV6)¹⁰	Primarily from saliva	Nearly 100% of the population, typically before the age of 3	Fever, diarrhea, rash (roseola). Reactivation. Can occur in the brain, lungs, heart, kidney, and gastrointestinal tract.	Has been found in the uterus in infertility, and in the thyroid in Hashimoto's thyroiditis. Also as a trigger for a subset of MS and myalgic encephalitis (chronic fatigue syndrome).
Herpes Simplex I & II¹¹ HSV-1 & HSV-2 HSV-1: oral and nasal lesions (cold sores) HSV-2: genital lesions	Transmission requires intimate contact	About 90% of people have one or both viruses. HSV-1 is more prevalent.	Can cause both mucocutaneous lesions and systemic symptoms. HSV-1: 30% have recurrent outbreaks. HSV-2 : Recurrence of lesions are 4-5 times more likely in the first year.	HSV-1: Fever, anorexia, and local edema of oral mucosa affecting swallowing. HSV-2: Inguinal adenopathy and flu-like illness. Neurological issues, meningitis, bladder paresis, dysuria, proctitis, bowel dysfunction, psychological distress.
Varicella-zoster¹² Initial infection is chickenpox. Reactivated form is shingles.	Transmission through touching blisters, saliva, or mucus of an infected person.	> 95% of American adults have had chickenpox. Incidence of chickenpox has dropped with the vaccine, but with a concurrent rise in shingles. 1 in 3 US adults get shingles. Risk increases as you age.	Shingles and/or postherpetic neuralgia: Pain and numbness along nerve pathways, commonly on the trunk or on the face, with or without lesions	Serious problems may include pneumonia (bacterial and viral), brain infection (encephalitis), and kidney problems

⁵ Whitley RJ. Herpesviruses. In: Baron S, editor. Medical Microbiology, 4th edition. Galveston (TX): University of Texas Medical Branch at Galveston; 1996. Chapter 68. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK8157/>

⁶ Hoover K, Higginbotham K. Epstein Barr Virus. [Updated 2021 Aug 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK559285/>

⁷ Hoover K, Higginbotham K. Epstein Barr Virus. [Updated 2021 Aug 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK559285/>

⁸ Grotto I, Mimouni D, Huerta M, Mimouni M, Cohen D, Robin G, Pitlik S, Green MS. Clinical and laboratory presentation of EBV positive infectious mononucleosis in young adults. Epidemiol Infect. 2003 Aug;131(1):683-9. doi: 10.1017/s0950268803008550. PMID: 12948368; PMCID: PMC2870009.

⁹ Gupta M, Shorman M. Cytomegalovirus. [Updated 2022 May 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK459185/>

¹⁰ <https://hhv-6foundation.org/what-is-hhv-6#:~:text=HHV%2D6%20infects%20nearly%20100,seizures%2C%20encephalitis%20or%20intractable%20seizures>

¹¹ Wald A, Corey L. Persistence in the population: epidemiology, transmission. In: Arvin A, Campadelli-Fiume G, Mocarski E, et al., editors. Human Herpesviruses: Biology, Therapy, and Immunoprophylaxis. Cambridge: Cambridge University Press; 2007. Chapter 36. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK47447/>

¹² <https://health.mo.gov/living/healthcondiseases/communicable/chickenpox.php>

Clinical Relevance

The pathophysiology of chronic viral infections arises from immune dysregulation, resulting in both immune suppression and a concurrent increase in inflammation throughout the body. Interestingly, viral illness can be either a result of, or the cause of, a number of other illnesses in the body. This can make the diagnosis challenging as these symptoms can imitate other common health concerns. For that reason, it is important to identify whether the following issues may also be present:

- Nutritional deficiencies
- Thyroid dysfunction
- Adrenal dysfunction
- Mitochondrial dysfunction
- Gastrointestinal disorders
- Autoimmunity (e.g., Lupus, RA, MS, Hash, IBD)
- Other chronic infections (Lyme, parasites, mycotoxin illness)

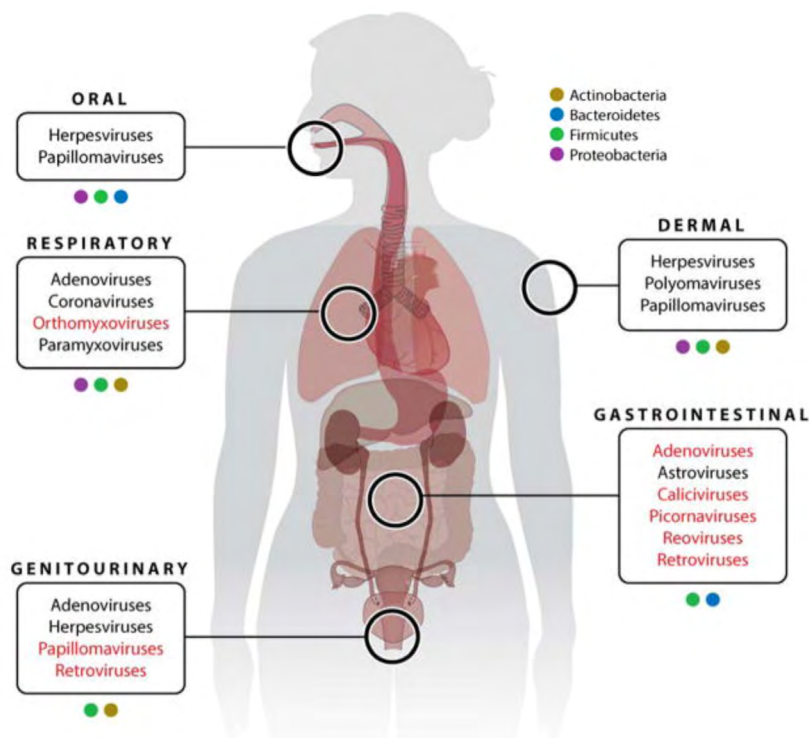
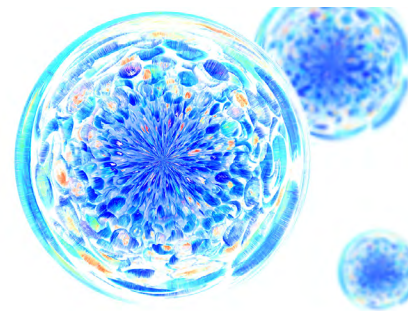


Figure 2. Robinson CM, Pfeiffer JK. Viruses and the Microbiota. Annu Rev Virol. 2014¹³

Risk Factors

- Exposure to an individual with an active infection; activities where saliva is shared (using the same utensils, drinking glass, kissing, etc.); poor sanitary hygiene (improper hand washing); or sexual contact.
- Stress weakens the immune system and plays a role in both viral transmission and reactivation.
- Other chronic illnesses that affect the immune system, including cancers, autoimmune diseases, and digestive issues such as IBS/IBD.
- Poor commensal bacterial diversity, which can lead to lowered immune response and susceptibility to viruses.

¹³ Robinson CM, Pfeiffer JK. Viruses and the Microbiota. Annu Rev Virol. 2014;1:55-69.doi: 10.1146/annurev-virology-031413-085550. PMID: 25821837; PMCID: PMC4373533.



Clinical Pearl #1 - Address the gut

The microbiome plays a vital role in immune function and defending against viral infections in the following ways:

- A healthy microbiome is responsible for both inducing tolerance and competence in the immune system. Gut dysbiosis has been shown to alter immune functions of the gut both locally and systemically.
- Lipopolysaccharides (LPS) produced by gram-negative bacteria are one of the main contributors to systemic inflammation and immune dysregulation.
- The microbiota can inhibit infection by some viruses via its influence on the intestinal epithelium, viral attachment, and the host environment.¹⁴
- Those with chronic viral infections are often immunocompromised, and viral infections can make them more prone to microbial dysbiosis in the gut and all of its downstream effects.⁴

There is now a growing body of literature regarding the role of the virome in health. What has become apparent is that the virome can be associated with both beneficial and adverse outcomes for health.¹⁵

Working on clearing overgrowth, supporting beneficial flora, and supporting intestinal permeability will help strengthen the immune system and reduce viral threats.

Clinical Pearl #2 - Support the Mitochondria

Our mitochondria produce the cellular energy we need for optimal functioning. Oxidative stress and excess inflammation, especially that which can occur during an acute or chronic illness, can impair the function of our mitochondria and contribute to fatigue, pain, and other symptoms.

Be sure to support the mitochondria with diet, nutrients, botanicals, and stress reduction.

Lifestyle Recommendations

- Support your treatment plan with simple yet effective lifestyle recommendations in our Comprehensive Cleansing Program™ Lifestyle Guide.
- Patients prone to chronic viral illness benefit more from gentle therapeutics such as walking, mild-to-moderate resistance training, and stretching (as opposed to intense physical activities like cross-fit, high-intensity interval training, or long-distance endurance exercise).
- Stress reduction techniques and activities, including exposure to nature, biofeedback, acupuncture, deep breathing, yoga, journaling, and massage, can help tone the sympathetic nervous system and support immune system function. It can also help restore balance in the microbiome.
- Optimize sleep for restoration.
- Maintain hydration with adequate fluid intake and electrolytes.

¹⁴ Robinson CM, Pfeiffer JK. Viruses and the Microbiota. *Annu Rev Virol.* 2014;1:55-69. doi: 10.1146/annurev-virology-031413-085550. PMID: 25821837; PMCID: PMC4373533.

¹⁵ Liang G, Bushman FD. The human virome: assembly, composition and host interactions. *Nat Rev Microbiol.* 2021 Aug;19(8):514-527. doi: 10.1038/s41579-021-00536-5. Epub 2021 Mar 30. PMID: 33785903; PMCID: PMC8008777.



Therapeutic Plan Suggestions

Viral/Post-Viral Illness – Chronic Support PROTOCOL INCLUDES 2 PHASES

PHASE I: USE [BIOCLEAR® MICROBIOME DETOX PROGRAM](#) FOR 1-2 MONTHS FOR GUT SUPPORT

CORE PROTOCOL

Biocidin® LSF, Biocidin® Liquid, or Biocidin® Capsules	Titrate to 2-3 pumps 2x/day	Titrate to 10 drops 2x/day	Titrate to 2 capsules 2x/day
G.I. Detox®+	2 capsules at bedtime. 1 hour away from food, supplements, and medications. Temporarily increase dose to 2 capsules 2-3x/day if Herxheimer reaction observed/worsens.		
Profloora™ 4R	1 capsule any time		

ADDITIONAL SUPPORT

Dentalcidin®	2-3x/day
Dentalflora™	Dissolve 1 tablet in mouth daily at bedtime, at least 30 minutes away from other oral care, food, or drinks

PHASE II: USE [COMPREHENSIVE CLEANSING PROGRAM™](#) FOR APPROPRIATE DURATION

CORE PROTOCOL

Biocidin® LSF	Titrate to 2 pumps 2x/day
G.I. Detox®+	2 capsules at bedtime. 1 hour away from food, supplements, and medications. Temporarily increase dose to 2 capsules 2-3x/day if Herxheimer reaction observed/worsens.
Profloora™ 4R	1 capsule any time
G.I. InnerCalm™	1 stick pack mixed in water, 1-2 times daily, taken any time
Olivirex®	Titrate to 2 capsules 2x/day
Biotonic®	20 drops 2x/day
Dentalcidin®	2-3x/day
Dentalflora™	Dissolve 1 tablet in mouth daily at bedtime, at least 30 minutes away from other oral care, food, or drinks

Additional Therapeutics/Supplements

Immune Support	Mitochondrial Support
Monolaurin	Liposomal glutathione or NAC
L-Lysine	Alpha-lipoic acid
Zinc picolinate	NAD+/Nicotinamide riboside
Vitamin C as sodium ascorbate or ascorbic acid	Magnesium chelate
Vitamine D/K2	Acetyl-L-carnitine
Quercetin	B-complex vitamins, including methylated folate and cobalamin
Elderberry	Cordyceps (if mushrooms are tolerated)
Echinacea	Rhodiola

