

# POST-COVID / LONG COVID

## Post-COVID Syndrome / Long COVID / Post-Acute Sequelae of COVID-19 (PASC)

### WHO Clinical Case Definition:

- Post-COVID-19 Condition occurs in individuals with a history of SARS-CoV2 infection (usually 3 months from the onset of COVID) with symptoms that last for  $\geq 2$  months and cannot be explained by an alternative diagnosis.

## Presentation

- Wide spectrum of symptoms with multi-organ system involvement
- Common symptoms include fatigue, shortness of breath, and cognitive dysfunction and generally have an impact on everyday functioning
- Symptoms may persist from initial illness or develop following initial recovery
- Severity of initial COVID illness does not correlate with post-COVID symptoms
- Symptoms often wax and wane
- Symptoms may include unmasking of underlying conditions
- Symptoms often include a strong psychosocial component

## Evaluation

- Evaluate physical, social and psychological consequences and functional limitations
- Conduct limited work up focusing on major symptomatology
- Avoid excess testing, as labs and imaging are often normal
- Cognitive testing can identify true deficits
- Address mental health and sleep disturbances

## Children and Teens

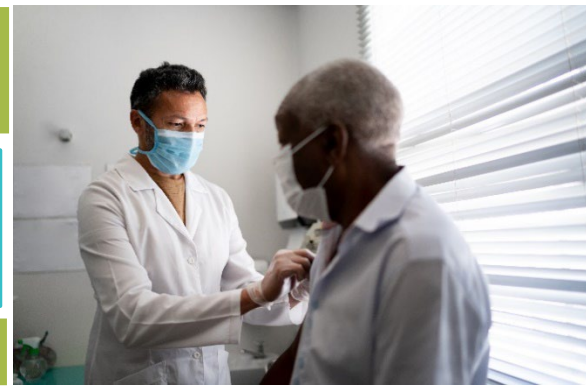
- Post-viral hyper responsiveness common - exacerbated by those with atopic histories, smoking parent, asthma
- Increased anxiety and depression
- Cognitive changes most challenging
- May see unmasking of diabetes

## Treatment

- Multi-disciplinary approach with focus on healing rather than therapies
- Supportive provider system is essential
- Gradual increase in activity – low impact exercise is beneficial
- Address mental health and sleep disturbances
- Role of Integrative therapies for treating pain and fatigue
- Refer only medically complex patients to specialty Long-COVID Clinics

## Specialty Long-COVID Clinics

[UCSD Post-COVID Care](#) | [Scripps COVID Recovery Program](#)  
[Post-COVID Care Centers in California](#)



## RANGE OF SYMPTOMS:

- Fatigue (58%)
- Headache (44%)
- Attention Deficit (27%)
- Hair Loss (25%)
- Dyspnea (24%)
- Ageusia (23%)
- Anosmia (21%)
- Polypnea (21%)
- Cough (19%)
- Joint Pain (19%)
- Sweat (17%)
- Memory Loss (16%)
- Nausea (16%)
- Chest Pain (16%)
- Hearing Loss (15%)
- Anxiety (13%)
- Depression (12%)
- Digestive Disorders (12%)
- Cutaneous Signs (12%)
- Palpitations (11%)
- Resting HR increase (11%)
- Fever (11%)
- Sleep Disorder (11%)
- Weight Loss (12%)
- Pain (11%)

Lopez-Leon et al, Sci Rep 11, 16114 (2021)

## Resources

### Support Groups

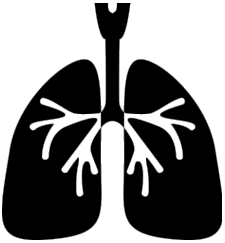

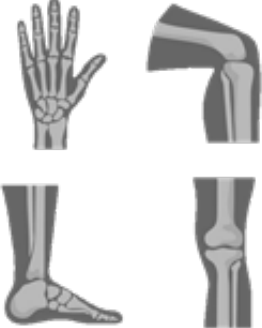


[Survivor Corps](#)  
[Long-COVID Alliance](#)  
[Support Group — Body Politic](#)  
[Long COVID Kids Post COVID Syndrome](#)  
[How Right Now - CDC campaign to promote emotional well-being](#)

### Patient Resources

[Caring for People with Post-COVID Conditions](#)  
[Post-COVID Conditions](#)  
[Long COVID Communications Toolkit](#)



# Additional Information

System	Presentation	Evaluation/Treatment
<p><b>Pulmonary</b></p> 	<ul style="list-style-type: none"> <li>• Primary symptoms of cough, shortness of breath, fatigue, chest pain and decreased exercise tolerance</li> <li>• Secondary symptoms of palpitations, dizziness, anxiety can be exacerbated by shortness of breath</li> <li>• Laryngo-Pharyngeal Reflux (LPR) may lead to cough and reactive airway symptoms</li> <li>• Chest myopathy from COVID-19 skeletal muscle injury and viral airway hyperresponsiveness contribute</li> <li>• Alarm cytokines, vagal nerve inflammatory mediators, and vocal cord dysfunction may be implicated</li> </ul>	<ul style="list-style-type: none"> <li>• Pulmonary function tests may be normal</li> <li>• Evaluate Sleep apnea – especially in those reporting fatigue</li> <li>• Treat (LPR) reflux – diet and lifestyle changes and alginates</li> <li>• Pulmonary Rehab may be beneficial</li> <li>• Gradual increase in physical activity</li> </ul>
<p><b>Cardiology</b></p> 	<ul style="list-style-type: none"> <li>• Chest discomfort and palpitations</li> <li>• Dysautonomia (tachycardia and orthostasis)</li> <li>• Exercise Intolerance</li> <li>• Postural Orthostatic Tachycardia Syndrome (POTS) may be precipitated by cardiac deconditioning. Occurs typically in females of childbearing age</li> <li>• Important to evaluate for hypertrophic cardiomyopathy, particularly in young athletes</li> <li>• Resolution of symptoms generally a very slow process</li> </ul>	<ul style="list-style-type: none"> <li>• EKG may show tachycardia or PVCs</li> <li>• Echocardiogram typically normal</li> <li>• Orthostatic VS and if needed tilt-table testing</li> </ul>
<p><b>Rheumatology</b></p> 	<ul style="list-style-type: none"> <li>• Fatigue and pain - joint pain, localized point pain-especially back and neck</li> <li>• Some develop autoimmune disease post COVID</li> <li>• Myalgic Encephalomyelitis/Chronic Fatigue Syndrome - post exertion worsening of symptoms, unrefreshing sleep, cognitive impairment</li> <li>• Fibromyalgia – pain generalized, fatigued, unrefreshing sleep (female and prior use of corticosteroids increases risk)</li> <li>• Triggers for relapse: physical activity, stress, exercise, mental activity, menstruation</li> <li>• Important to exclude autoimmune disorders that may mimic Long COVID</li> <li>• Collaborative supportive care</li> </ul>	<ul style="list-style-type: none"> <li>• Mindfulness, acupuncture, graduated exercise program, (water, gentle resistance work, Pilates, Zumba)</li> <li>• Electrotherapy- TENS for localized pain</li> <li>• Replace low Vit D, Mg (may help with HA and pain in some)</li> <li>• Amitriptyline (good with poor sleep), duloxetine</li> <li>• For neuropathic symptoms: gabapentin, pregabalin</li> </ul>
<p><b>Neurology</b></p> 	<ul style="list-style-type: none"> <li>• Neuro symptoms are disabling but poorly defined</li> <li>• Poor cognitive performance, attention deficit, memory deficit, abnormal sensation, ataxia</li> <li>• Females at greater risk</li> <li>• Imaging shows vulnerable brain regions involved in memory, attention and executive function</li> <li>• Pathogenesis – autoimmunity, endothelial dysfunction</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple treatments under investigation</li> <li>• Vaccine may be protective of neurologic sequelae</li> <li>• Improvement in 6-12 months in many but not all</li> </ul>
<p><b>Emotional and Mental Health</b></p> 	<ul style="list-style-type: none"> <li>• Traumatized with memories of illness, PTSD</li> <li>• Disturbed by cognitive symptoms – brain fog</li> <li>• Frustrated, angry, sleep deprived and frightened</li> <li>• May feel that symptoms will never resolve</li> <li>• Anxiety and Depression may develop in one-third of individuals at 6 months post COVID in those with prior history</li> <li>• Females at higher risk</li> <li>• Important to address cognitive impairments</li> </ul>	<ul style="list-style-type: none"> <li>• Cognitive Behavioral Therapy</li> <li>• Breath retraining and relaxation</li> <li>• Physical activity</li> <li>• Natural sunlight helps regulate mood and sleep</li> <li>• Address sleep hygiene</li> <li>• Compensatory cognitive training for brain fog</li> <li>• <a href="http://www.cogsmart.com">www.cogsmart.com</a></li> </ul>

