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

WHO Clinical Case Definition Working group defines as Post-COVID-19 Condition occurring in individuals with a history of SARS-CoV2 infection, usually 3 months from the onset, with symptoms that last for at least 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 illness does not correlate with post-COVID symptoms
- Symptoms often wax and wane.
- Patients may experience unmasking of underlying conditions, e.g., GERD, Asthma, and Sleep disorders.
- Often a strong psychosocial component present

**Evaluation**

- Evaluate physical, social, and psychological consequences and functional limitations
- Limited work up focusing on major symptomatology
- Avoid excess testing, as labs and imaging are often normal
- Cognitive testing can identify true deficits (e.g., MOCA)
- Address mental health and sleep disturbances

**Children and Teens**

- Post viral hyper responsiveness common - exacerbated by those with atopic histories, smoking parent, asthma prone
- 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 essential
- Gradual increase in activity – low impact 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

**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 Disorders (11%)
- Weight Loss (12%)
- Pain (11%)


**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 Q&A
- Long COVID Communications Toolkit

For the latest updates on COVID-19, visit:
[www.sandiegocounty.gov/COVIDHealthProfessionals](http://www.sandiegocounty.gov/COVIDHealthProfessionals)
### Pulmonary

**Presentation**
- Primary symptoms of cough, shortness of breath, fatigue, chest pain and decreased exercise tolerance
- Secondary Symptoms of palpitations, dizziness, anxiety can be exacerbated by shortness of breath
- Laryngo-Pharyngeal Reflux (LPR) may lead to cough and reactive airway symptoms
- Chest myopathy from COVID-19 skeletal muscle injury and viral airway hyperresponsiveness contribute
- Alarm cytokines, vagal nerve inflammatory mediators, and vocal cord dysfunction may be implicated

**Evaluation/Treatment**
- Pulmonary function tests may be normal
- Evaluate Sleep apnea – especially in those reporting fatigue
- Treat (LPR) reflux – diet and lifestyle changes and alginates
- Pulmonary Rehab may be beneficial
- Gradual increase in physical activity

### Cardiology

**Presentation**
- Chest Discomfort and palpitations
- Dysautonomia (Tachycardia and orthostasis)
- Exercise Intolerance
- POTS Syndrome may be precipitated by cardiac deconditioning. Occurs typically in females of childbearing age
- Important to valuate for Hypertrophic cardiomyopathy screening particularly in young athletes
- Resolution of symptoms generally a very slow process

**Evaluation/Treatment**
- EKG may show tachycardia or PVCs, and Echocardiogram typically normal
- Orthostatic VS and if needed tilt-table testing

### Rheumatology

**Presentation**
- Fatigue and pain - joint pain, localized point pain especially back and neck
- Some develop autoimmune disease post covid
- Myalgic Encephalomyelitis/Chronic Fatigue Syndrome - post exertion worsening of symptoms, unrefreshing sleep, cognitive impairment
- Fibromyalgia – pain generalized, fatigued, unrefreshing sleep
- Female and prior use of corticosteroids increased risks
- Triggers for relapse physical activity, stress, exercise, mental activity, menstruation
- Important to exclude autoimmune disorders that may mimic long COVID
- Collaborative supportive care

**Evaluation/Treatment**
- Mindfulness, acupuncture, graduated exercise program, (water, gentle resistance work, Pilates, Zumba)
- Electrotherapy- TENS for localized pain
- Replace low Vit D, Mg (may help with HA and pain in some).
- Amitriptyline (good with poor sleep), duloxetine
- For neuropathic symptoms, gabapentin, pregabalin

### Neurology

**Presentation**
- Neuro symptoms are disabling but poorly defined
- Poor cognitive performance, attention deficit, memory deficit, abnormal sensation, ataxia
- Females at greater risk
- Imaging shows vulnerable brain regions involved in memory, attention and executive function
- Pathogenesis – autoimmunity, endothelial dysfunction

**Evaluation/Treatment**
- Multiple treatments under investigation
- Vaccine protective of neurologic sequelae
- Improvement in 6-12 months in many but not all

### Emotional and Mental Health

**Presentation**
- Traumatized with memories of illness, PTSD
- Disturbed by cognitive symptoms – brain fog
- Frustrated, angry, sleep deprived and frightened
- Feeling they are never going to get better
- Anxiety and Depression – 1/3 at 6 months post COVID in those with prior history
- Females at higher risk
- Important to address cognitive impairments

**Evaluation/Treatment**
- Cognitive Behavioral Therapy
- Breath retraining and relaxation.
- Physical activity
- Natural sunlight helps regulate mood and sleep
- Address Sleep hygiene
- Compensatory Cognitive training for brain fog
  [www.cogsmart.com](http://www.cogsmart.com)