

Post-acute COVID-19 Syndrome (PACS or PCS)

Rocky Mountain Tribal Epidemiology Center March 16, 2021



Also known as Long Term COVID-19, Long-Haul COVID, or Post-Acute Sequelae of SARS-CoV-2 infection or (PASC), chronic COVID syndrome (CCS)

Description: Patients who have recovered from the immediate symptoms of COVID-19 infection can still have persistent symptoms for weeks or months. It is not known if these patients are experiencing persistent infection with SARS-CoV2, the virus that causes COVID-19, or if they are experiencing the sequelae of the cleared infection.¹ The initial infection does not have to be severe for these persistent symptoms to occur. Patients do not have to be in a high-risk categories or have co-morbidities to experience these persistent symptoms.²

Cause: It is unknown at this time what the cause(s) of long term COVID are but there are many studies underway, many are focusing on inflammation in the brain³ and vascular effects⁴. Patients may also be interested in participating in the FDA listed [Long Haul COVID Clinical Trials](#).

Presentation: Between 10% and 30% of COVID-19 patients experience this prolonged illness.⁵ Like acute COVID-19, long term COVID-19, symptoms can occur in almost any organ system across the body. The CDC reports that the most common symptoms are fatigue, dyspnea, cough, arthralgia, and chest pain.⁶ Other symptoms include cognitive impairment, depression, myalgia, headache, fever, and palpitations. Less common but serious complications can occur in the cardiovascular, respiratory, renal, neurological/psychiatric, and dermatologic organ systems.

Response: Moving from a pandemic response that prioritizes acutely ill patients to a response that can support chronically ill recovering patients will take forethought. Lessons from previous coronavirus outbreaks suggest that fatigue and psychiatric effects could last for years.⁷ Considering and planning rehabilitation care for patients should begin as soon as possible. Because COVID-19 is a multi-system disease about which little is known the best approach may be to form a multidisciplinary group of specialists or be ready to refer patients to such a group.⁸

Prognosis: The prognosis of many patients with long term COVID is still unclear. With appropriate treatment and rehabilitation and many are expected to recover over time.

Non-medical supports that patients report as being helpful are online peer support groups, remote, flexible or reduced work hours, but most of all, compassionate health care providers.⁹

¹ Greenhalgh et al., "Management of Post-Acute Covid-19 in Primary Care."

² Moreno-Pérez et al., "Post-Acute COVID-19 Syndrome. Incidence and Risk Factors."

³ De Felice et al., "Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and the Central Nervous System"; Labò, Ohnuki, and Tosato, "Vasculopathy and Coagulopathy Associated with SARS-CoV-2 Infection."

⁴ "COVID-19 (Coronavirus)."

⁵ Greenhalgh et al., "Management of Post-Acute Covid-19 in Primary Care."

⁶ CDC, "COVID-19 and Your Health."

⁷ Lam, "Mental Morbidities and Chronic Fatigue in Severe Acute Respiratory Syndrome Survivors."

⁸ Davis et al., "Characterizing Long COVID in an International Cohort."

⁹ Ladds et al., "Persistent Symptoms after Covid-19."

Patient- Generated Quality Principles For Long Covid Services¹⁰

By BMJ, the British Medical Journal

Access

Everyone with long COVID-19 should have access to appropriate care, whether or not they have had a positive laboratory test for Covid-19 or a hospital admission.

Burden of illness

The burden on the patient for accessing, navigating and coordinating their own care should be minimized. Care pathways should be clear and referral criteria explicit.

Clinical responsibility and continuity of care

Clinical responsibility for the patient should be clear. Whilst specialist investigation and management of particular complications is important, one clinician should take care of the whole patient and provide continuity of care.

Multi-Disciplinary rehabilitation services

Patients requiring a formal rehabilitation package should be assessed by a multi-disciplinary team including (e.g.) rehabilitation, respiratory and cardiac consultant, physiotherapist, occupational therapist, psychologist and (if needed) neurologist.

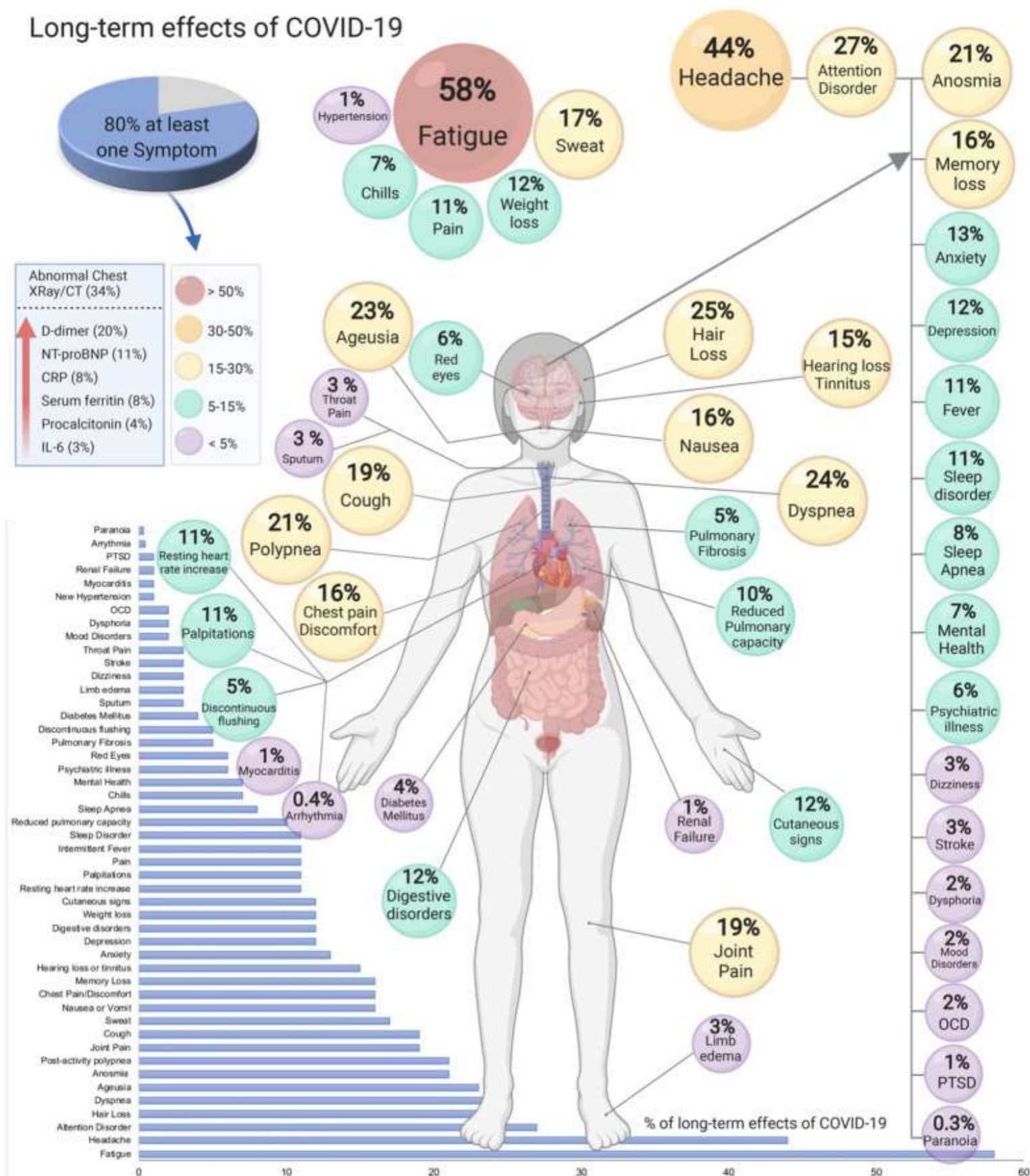
Evidence-based standards

Standards and protocols should be developed, published, and used so that investigation and management is consistent wherever care is received.

Further development of the knowledge base and clinical services

Clinical teams should proactively collect and analyze data on this new disease so as to improve services and build the knowledge base. Patients should be partners in this endeavor. As a first step, patients need to be counted and prevalence rates and prognosis established.

Long-term effects of COVID-19



¹¹ Lopez-Leon et al., "More than 50 Long-Term Effects of COVID-19."

"Long covid" in primary care

Assessment and initial management of patients with continuing symptoms

Post-acute covid-19 appears to be a multi-system disease, sometimes occurring after a relatively mild acute illness. Clinical management requires a whole-patient perspective. This graphic summarises the assessment and initial management of patients with delayed recovery from an episode of covid-19 that was managed in the community or in a standard hospital ward.

An uncertain picture



The long term course of covid-19 is unknown. This graphic presents an approach based on evidence available at the time of publication.

However, caution is advised, as patients may present atypically, and new treatments are likely to emerge

Managing comorbidities

Many patients have comorbidities including diabetes, hypertension, kidney disease or ischaemic heart disease. These need to be managed in conjunction with covid-19 treatment. Refer to condition specific guidance, available in the associated article by Greenhalgh and colleagues

Safety netting and referral

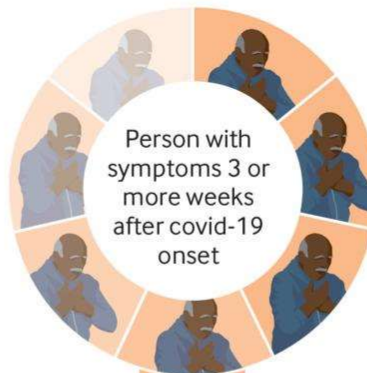
The patient should seek medical advice if concerned, for example:

- Worsening breathlessness
- $\text{PaO}_2 < 96\%$
- Unexplained chest pain
- New confusion
- Focal weakness

Specialist referral may be indicated, based on clinical findings, for example:

- Respiratory** if suspected pulmonary embolism, severe pneumonia
- Cardiology** if suspected myocardial infarction, pericarditis, myocarditis or new heart failure
- Neurology** if suspected neurovascular or acute neurological event

Pulmonary rehabilitation may be indicated if patient has persistent breathlessness following review



Person with symptoms 3 or more weeks after covid-19 onset

Clinical assessment

Full history
From date of first symptom

Current symptoms
Nature and severity

Examination, for example:

- Temperature
- Heart rate and rhythm
- Blood pressure
- Respiratory examination
- Functional status
- Pulse oximetry
- Clinical testing

If indicated

Assess comorbidities

Social and financial circumstances

Social, financial, and cultural support

Prolonged covid-19 may limit the ability to engage in work and family activities. Patients may have experienced family bereavements as well as job losses and consequent financial stress and food poverty. See the associated article by Greenhalgh and colleagues for a list of external resources to help with these problems

Medical management

- Symptomatic, such as treating fever with paracetamol
- Optimise control of long term conditions
- Listening and empathy
- Consider antibiotics for secondary infection
- Treat specific complications as indicated

Self management

- Daily pulse oximetry
- Attention to general health
- Rest and relaxation
- Self pacing and gradual increase in exercise if tolerated
- Set achievable targets

- Diet
- Sleep
- Quitting smoking
- Limiting alcohol
- Limiting caffeine

Mental health

In the consultation:

- Continuity of care
- Avoid inappropriate medicalisation
- Longer appointments for patients with complex needs (face to face if needed)

In the community:

- Community linkworker
- Patient peer support groups
- Attached mental health support service
- Cross-sector partnerships with social care, community services, faith groups

