



Post Acute Sequelae of COVID-19 (PASC)

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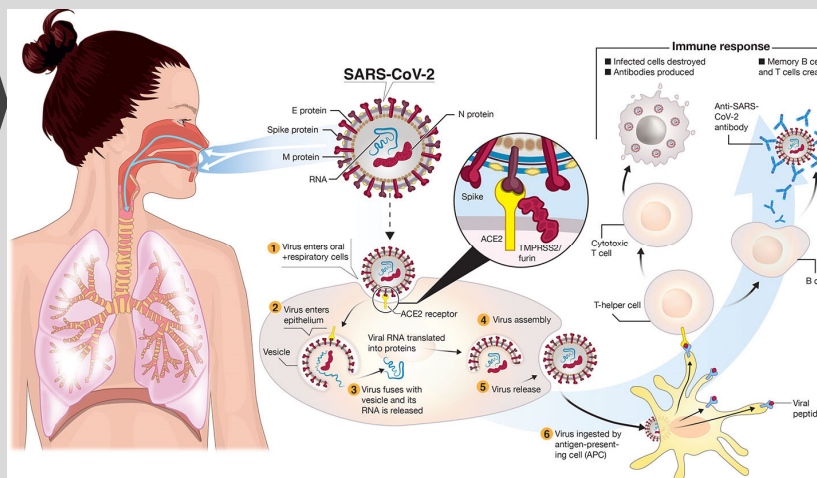


Objectives

- Understand theoretical causes of PASC
- Recognize the symptoms of PASC
- Understand the various treatment approached to PASC
- Call to ACTION regarding PASC/Fibromyalgia/Chronic fatigue syndrome

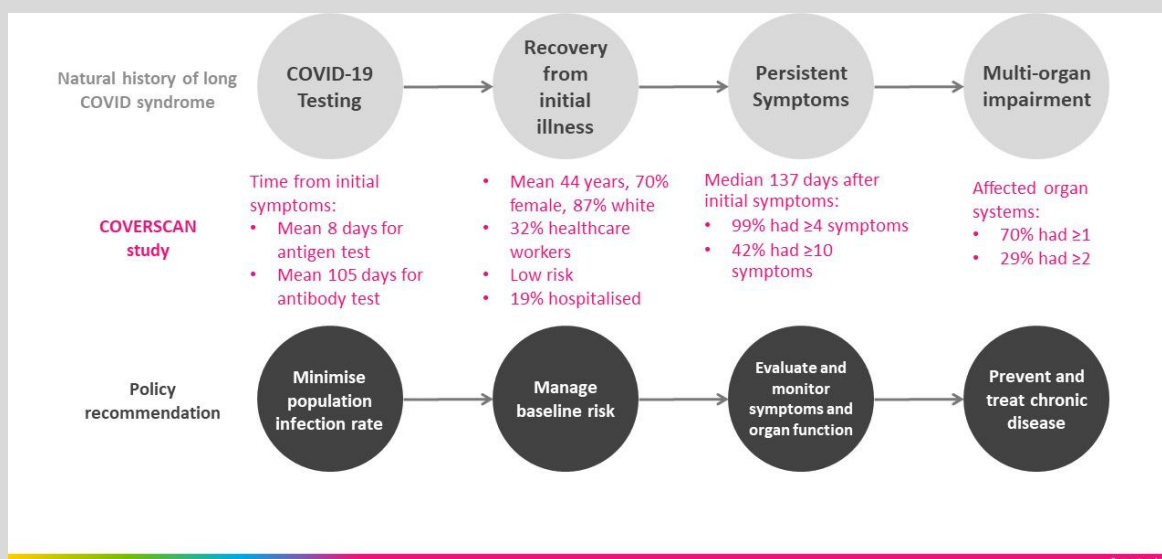
COVID-19 SARS-CoV-2

- > 177 million people infected
- Almost 4 million deaths
- 80% patients recover within 4 weeks
- < 15% require ICU stays which is over 6 weeks of medical care



Colin D. Funk, Craig Laferrière, and Ali Ardakani Pharmacol. 11:937. Funk CD, Laferrière C and Ardakani A (2020)

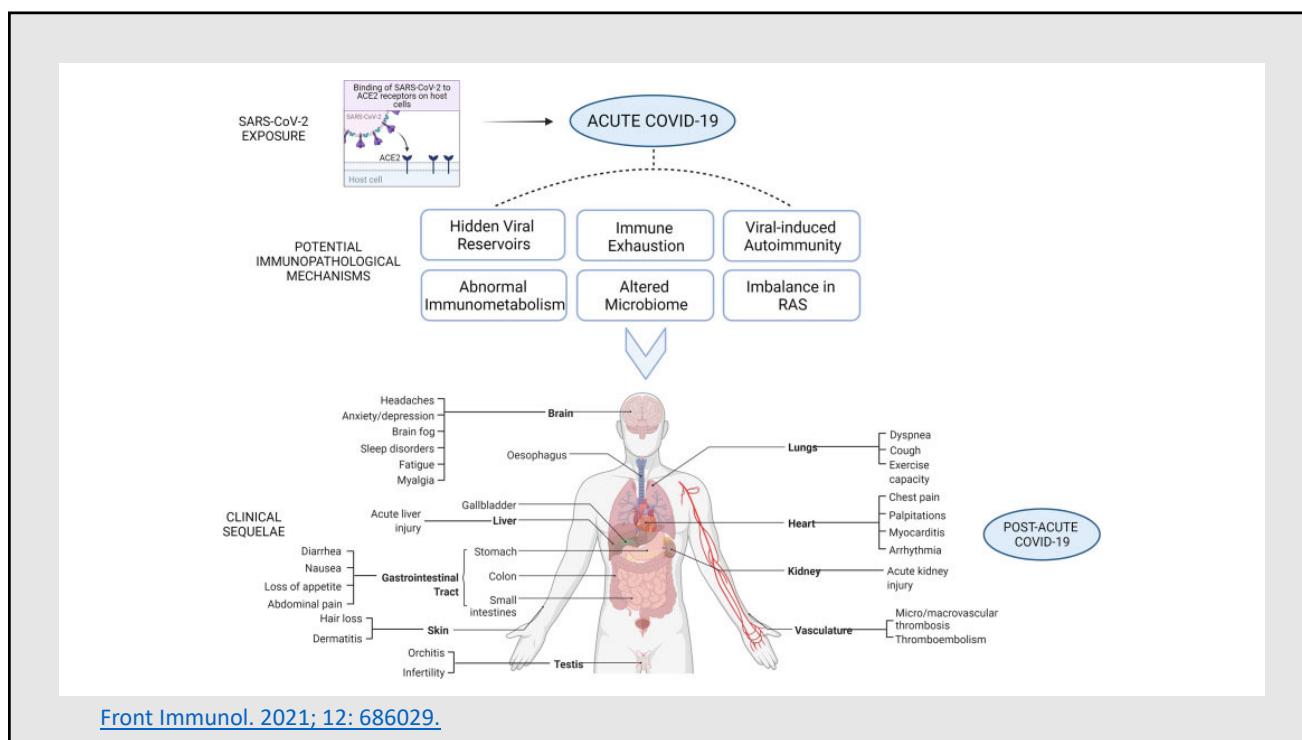
Natural history of post-COVID-19 syndrome, the COVERSCAN study in low-risk individuals (N=201) and policy recommendations.



Andrea Dennis et al. BMJ Open 2021;11:e048391

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BMJ Open



Theories behind PASC

- Chronic COVID-19 associated immune exhaustion
 - Continuous release of senescence-associated secretory phenotype (SASP) from the residual senescent cells
- Altered microbiome
- Abnormal immunometabolism and mitochondrial dysfunction
 - T Cell exhaustion
- Viral induced autoimmunity
- Imbalance in the renin-angiotension system

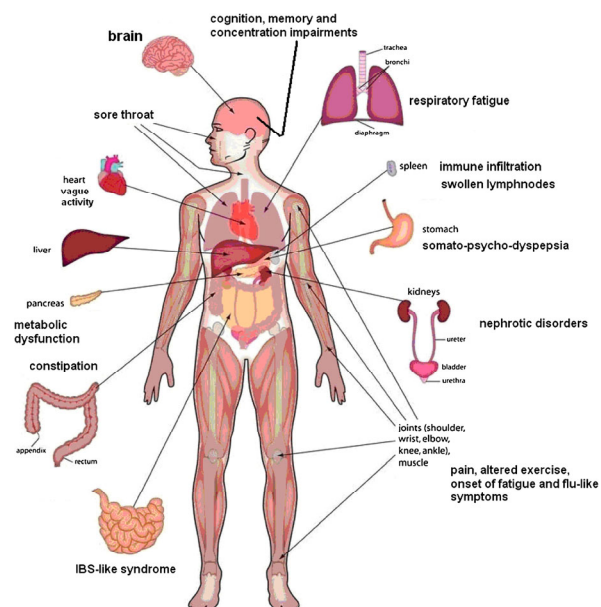
[Front Immunol. 2021; 12: 686029.](https://doi.org/10.3389/fimmu.2021.686029)

Definition of PASC

- > 12 weeks of symptoms that cannot be explained by an alternative diagnosis
- Heterogenous multi-organ symptoms
- Similar to many other post-viral chronic syndromes

Rev Neurol. 2021 Jun 1

Organs affected in
COVID long haul
similar to chronic
fatigue syndrome

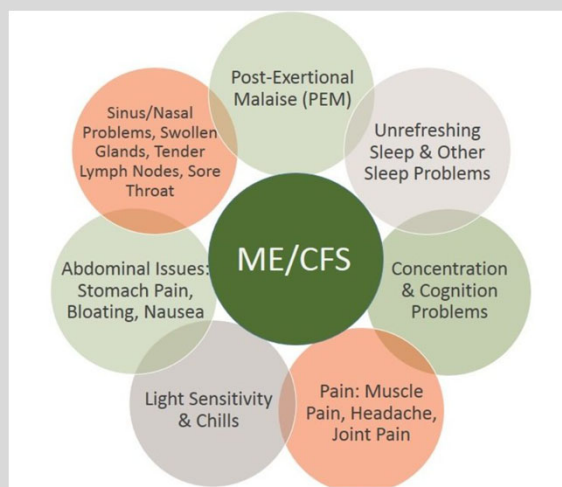


Geir Björklund et al, Biomedicine & Pharmacotherapy, 2019

Common Symptoms

- Myalgic encephalomyelitis/chronic fatigue
- Fibromyalgia
- Dysautonomia
- Anxiety/depression
- Sleep disturbances

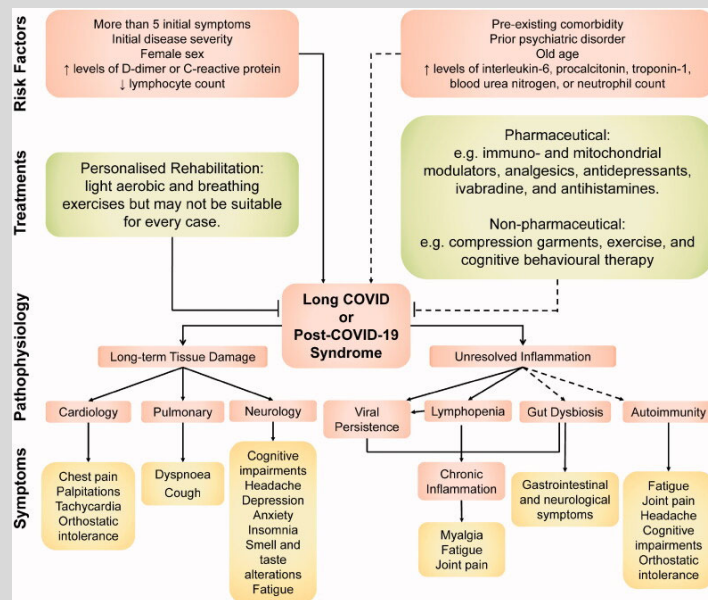
Myalgic Encephalomyelitis / Chronic Fatigue Syndrome



<https://solvecfs.org/about-the-disease/>

PASC Flow Chart

Yong. Infect Dis (Lond) 2021



Other Infections that Cause Similar Symptoms

Lyme disease

Epstein-bar virus (EBV)

HIV

Cytomegally virus (CMV)

Severe acute respiratory syndrome (SARS)

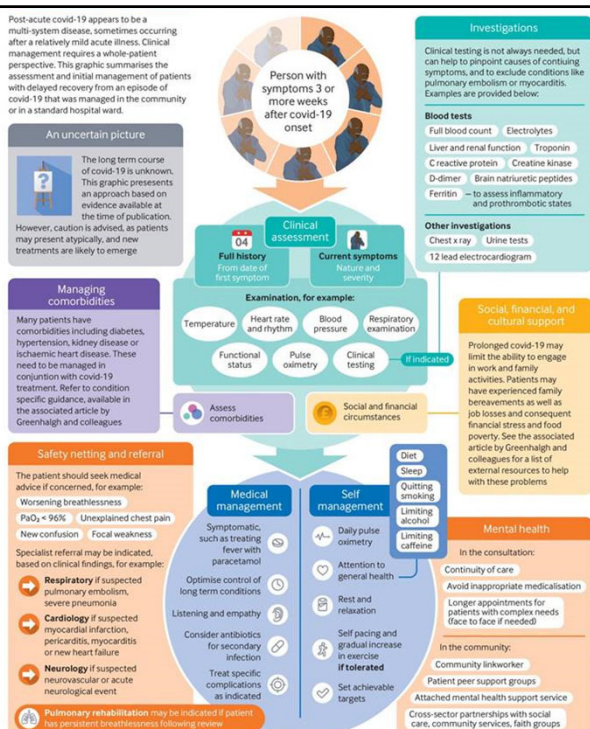
Middle East respiratory syndrome (MERS)

Multi-Disciplinary Treatment for PASC

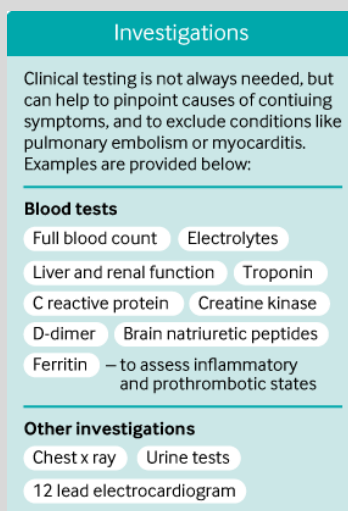
Supporting patients
Coping skills
Rehab

BMJ Summary Long COVID in primary care: assessment and initial management of patients with continuing symptom

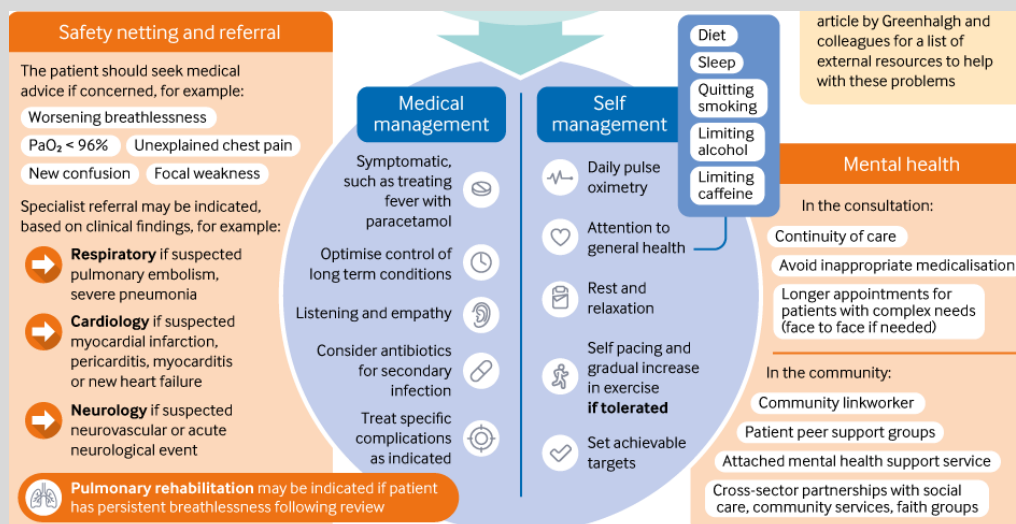
<https://www.bmj.com/content/370/bmj.m3026/infographic>



PASC Blood Tests Considerations in Primary Care

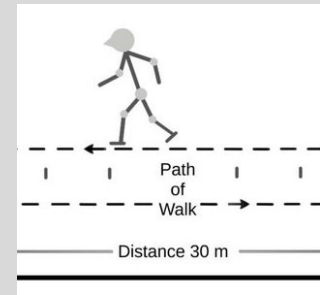


Post-Acute Chronic COVID-19 Management Considerations in Primary Care



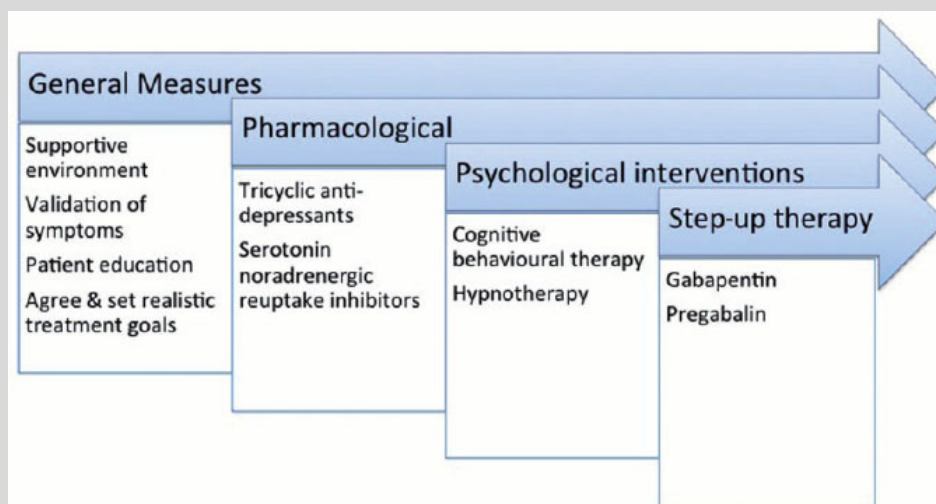
PASC-Dyspnea Treatments

- Pulse oximeter. SpO₂ >92% on RA.
- 6 minute walk test
- Imaging generally not necessary unless hypoxic
- Incidence of post-COVID-19 VTE in patients recovering from mild to moderate disease not known but probably not high risk
- Reassurance with recommendation for modest exercise, breathing techniques and adequate sleep. Recovery generally the rule, but time course prolonged (weeks to months)

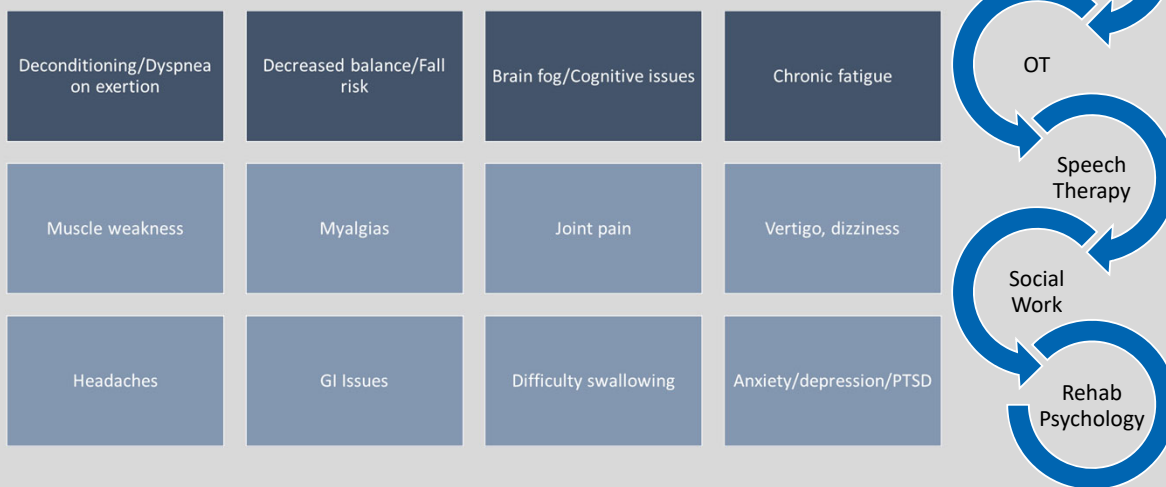


Chronic Abdominal Pain

STEP-UP APPROACH



Refer to Rehabilitation if unable to return to ADLs in COVID-19 Recovery Period



Approach to Therapeutics

- Risk: Benefit analysis
 - PT, Pulmonary Rehab, CBT
- Listen Intently
 - Validation of concerns
- Remain open to other diagnostic considerations
 - Avoid Anchor bias especially with prolonged symptoms
- Consider Palliative approach when appropriate

Call to Action

- Physicians need to recognize and validate patients symptoms
- We do not have a pill or an easy button
- Destigmatize that a person may not be the same after an infection
- Discuss lifestyle modifications focusing on exercise, diet
- Focus patients on what a new normal looks like
- Funding outcomes and trials for fatigue and chronic pain