

Whole Health System Approach to Long COVID



Patient-Aligned Care Team (PACT) Guide

U.S. Department of Veterans Affairs

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EXECUTIVE SUMMARY

The U.S. Department of Veterans Affairs (VA) Veterans Health Administration (VHA) is leading an effort to equip health care providers with a Veteran-centered Whole Health System approach to caring for Veterans with Long COVID, also known as post-COVID-19 conditions (PCC). Whole Health is an evidence-informed, multi-disciplinary, personalized, Veteran-driven approach that empowers and equips Veterans to take charge of their health and well-being, and to live life to the fullest.

Organizations across the world have defined Long COVID with differing parameters. Diagnosing and defining Long COVID is complicated as there are many signs, symptoms, and conditions that are associated with the syndrome. Additionally, it is important to separate three things: pre-existing symptoms or conditions, those that have worsened, and those that are new since an initial COVID-19 diagnosis. Risk factors for developing Long COVID signs and symptoms include female sex (Pelà G, 2022) (Fernández-de-Las-Peñas C, 2022), respiratory symptoms at the onset, and the severity of the illness (Asadi-Pooya AA, 2021). At the time of this writing, it is estimated that 4-7% of those diagnosed with COVID-19, or 2% of the U.S. population, will develop Long COVID (Xie Y, 2021). Based on approximately 600,000 known Veterans with a diagnosis of COVID-19, this equates to 24,000-42,000 Veterans. However, these numbers have the potential to be much higher, as the VA has more than 6 million Veterans in care.

VA's Office of Research and Development, the Long COVID Community of Practice, and the Long COVID Integrated Project Team are working to organize, support, and report on the development of a national program to help all Veterans who have Long COVID. They collaborated to produce this document for health care providers to better facilitate defining, assessing, referring, and managing common Long COVID signs, symptoms, and potential subsequent conditions using a Whole Health System approach. It is not intended to replace clinical judgment. Rather, it provides suggestions for health care providers as they engage in shared health care decision-making with Veterans who have this syndrome. The information available on Long COVID is ever changing. This document will be periodically updated and republished as the scientific community learns more about Long COVID.

Definition of Long COVID, Post-COVID-19 Conditions and Post-Acute Sequelae of SARS-CoV-2 Infection

As mentioned above, organizations have defined Long COVID with differing parameters. The Centers for Disease Control and Prevention (CDC) and National Institutes of Health (NIH) define Long COVID as “new or worsening symptoms” from “4 weeks after first being infected” with COVID-19. According to the CDC, the term “post-COVID conditions” is an umbrella term for the wide range of physical and mental health consequences that are present four or more weeks after SARS-CoV-2 infection, including by patients who initially had mild or asymptomatic COVID-19. NIH employs the term, Post-Acute Sequelae of SARS-CoV-2 infection (PASC), the result of the direct effects of the virus. The World Health Organization (WHO) defines Long COVID as symptoms “lasting greater than 2 months, starting within 3 months from the onset” of COVID-19.

Signs and symptoms associated with Long COVID vary widely and can last for weeks, months, or years. In some individuals, signs and symptoms may resolve over time without treatment. Common signs and symptoms include tiredness or fatigue that interferes with daily life, signs and symptoms that get worse after physical or mental effort (post-exertional malaise), respiratory symptoms, cardiac symptoms, neurologic symptoms, digestive symptoms, joint or muscle pain, rash, changes in menstrual cycles, and others. The presentation of signs, symptoms and severity range widely making them difficult to diagnose. This guide highlights some of the more common Long COVID signs, symptoms, and potential subsequent conditions.

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**The VHA Long COVID Integrated Project Team Workstream 1:
Strategies and Best Practices**

With support from

The VHA Long COVID Integrated Project Team

The VHA Long COVID Community of Practice

The VHA Office of Primary Care

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The VHA Office of Patient Connected Care and Cultural Transformation

The VHA National Center for Health Promotion and Disease Prevention

VHA Pharmacy Benefits Management Services

The San Francisco VA HCS Office of Diversity, Equity, and Inclusion

DIRECTORY OF SIGNS, SYMPTOMS, AND OTHER POTENTIAL CONDITIONS

One-page guides are provided for signs, symptoms, and other potential subsequent conditions. Each guide is hyperlinked below and includes the following details: things to keep in mind, evaluation with labs and tests, PACT management, and consult suggestions.

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INTRODUCTION

VA's Office of Research and Development, the Long COVID Community of Practice, and the Long COVID Integrated Project Team are working to organize, support, and report on the development of a national program to help all Veterans who have Long COVID. They collaborated to produce this document for health care providers to better facilitate defining, assessing, referring, and managing common Long COVID signs, symptoms, and potential subsequent conditions using a Whole Health System approach. Whole Health is an evidence-informed, multi-disciplinary, personalized, Veteran-driven approach that empowers and equips Veterans to take charge of their health and well-being, and to live life to the fullest. (Gaudet T, 2019) (Krejci L, 2014)

As one of the largest health care systems in the United States, VHA is leading the charge to deliver care to Veterans with Long COVID whether post-COVID-19 conditions (PCC) (direct and indirect effects of the virus) and the subset Post-Acute Sequelae of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection (PASC) (direct effects of the virus), hereafter referred to as Long COVID. At the time of this writing, it is estimated that 4-7% (Xie Y, 2021) of those diagnosed with COVID-19, or 2% of the U.S. population, will develop Long COVID. Based on approximately 600,000 known Veterans with a diagnosis of COVID-19, this equates to 24,000-42,000 Veterans. However, these numbers have the potential to be much higher, as the VA has more than 6 million Veterans in care.

Organizations have defined Long COVID with differing parameters. The Centers for Disease Control and Prevention (CDC) and National Institutes of Health (NIH) define Long COVID as "new or worsening symptoms" from "4 weeks after first being infected" with COVID-19. According to the CDC, the term "post-COVID conditions" is an umbrella term for the wide range of physical and mental health consequences that are present four or more weeks after SARS-CoV-2 infection, including by patients who initially had mild or asymptomatic COVID-19. NIH employs the term, Post-Acute Sequelae of SARS-CoV-2 infection (PASC), the result of the direct effects of the virus. The World Health Organization (WHO) defines Long COVID as symptoms "lasting greater than 2 months, starting within 3 months from the onset" of COVID-19.

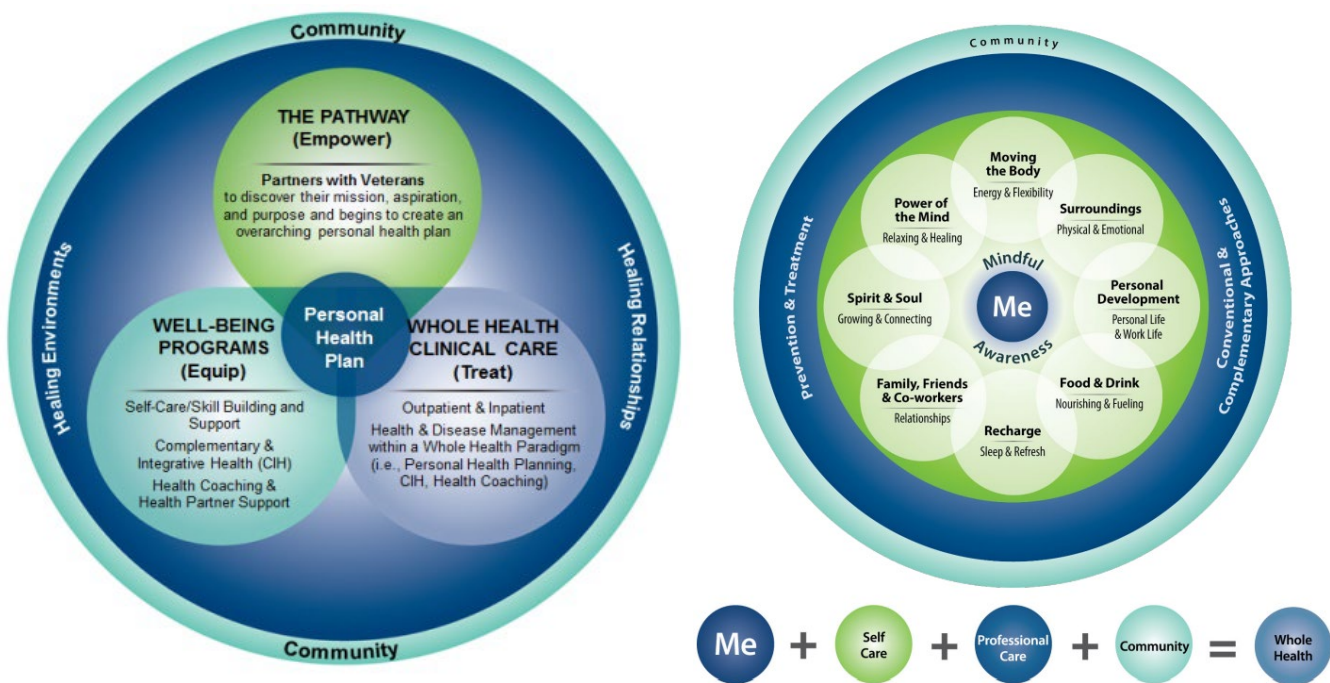
A challenge for many health care providers is diagnosing Long COVID because there are several signs and symptoms associated with the syndrome, some of which may resolve without treatment over time in certain individuals. It is important to separate pre-existing signs and symptoms from those that have worsened or those that are new since a COVID-19 diagnosis. This document is not intended to replace clinical judgment. Rather, it provides suggestions for health care providers as they engage in shared health care decision-making with Veterans who have this syndrome.

This guide is broken into several sections: an Executive Summary including a navigation guide, a primer on the Whole Health System approach, and quick reference guides for Veterans' care. Long COVID research is in its infancy and the information available on Long COVID is ever changing. For example, there is minimal evidence to-date on Long COVID and special populations such as racial and ethnic minorities and transgender people. This document will be periodically updated and republished as the scientific community learns more about Long COVID.

Whole Health System Approach to Long COVID Care

[Whole Health](#) is an evidence-based, multi-disciplinary, personalized, Veteran-driven approach that empowers and equips Veterans to take charge of their health and well-being, and to live life to the fullest. The VA has adopted the Whole Health System approach across many health sectors.

The [Whole Health System approach](#) consists of the following three components: The Pathway, Well-Being Programs, and Whole Health Clinical Care. Included in the Whole Health System are health coaching, [complementary and integrative health approaches](#) such as acupuncture and yoga, alongside conventional care.



WHAT IS MOST IMPORTANT TO YOU TO DISCUSS IN THE VISIT TODAY?

Discussing what is most important to the Veteran ensures that **the Veteran** and their unique circumstance **is at the center of health care**, not just their signs and symptoms. This encourages and emphasizes the Veteran’s ability to shape their health and well-being through **self-care** and **self-management**.

As part of this care, Veterans conclude their visit with a Personalized Health Plan that typically includes at least one specific, measurable, attainable, realistic, and time-bound (SMART) goal. [Building a SMART goal](#) with a provider injects the care and expertise of **professional care** for prevention and treatment aligned with the Veteran’s personal health plan. A SMART goal considers a Veteran’s needs and environment, the **community of support** a Veteran has, as well as those who rely on the Veteran for support, social determinants of health, and other important factors that affect a Veteran’s everyday life. These and other [Whole Health tools](#) help to ensure a Veteran-focused visit that empowers the Veteran to be an active participant in their health goals.

In the following pages, we delineate an evidence-informed Whole Health System approach to Long COVID care. Importantly, the Whole Health System of care is not solely a separate and standalone consult service or program, rather it is a system-wide approach. This document is intended to be a broad approach, leaving room for clinical judgment, individual circumstances, medical resources, and pre-existing referral patterns. As the knowledge around Long COVID evolves, additional iterations of this guide will become available.

ANOSMIA AND DYSGEUSIA

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Up to 46% of patients reported anosmia at greater than 4 weeks post-COVID-19 ¹ (NICE, 2021), and specifically 16% of non-hospitalized patients reported anosmia at 60- or 90-days post-COVID-19 onset. ² (Yoo S, 2022)

Things to Keep in Mind

- May need to prompt Veteran, as this may not be the primary complaint
- May be associated with cognitive changes³ (Douaud G, 2022), neurologic changes ⁴ (Premraj L, 2022), phantosmia (smells that are not present) and dysosmia (altered sense of smell/taste such as excessive chemical, salty or sour sensations)
- Assess for possible contributors such as sinus disease and rhinitis
- Assess the effect on food choices and quality of life
- Hypertension (HTN) after anosmia and dysgeusia may occur due to increased salt placed on food
- Educate on safety considerations (e.g., strategies to avoid spoiled food, increase vigilance to monitor safety detectors in the home, etc.)
- Assess pregnancy/lactation status, review teratogenic medications

Evaluation

Labs to Consider

- None

Tests to Consider

- None

PACT Management to Consider

- ICD-10 Code: U09.9, Post-COVID-19 condition, unspecified
- Intranasal steroids may be used if other nasal signs and symptoms with anosmia like congestion or rhinitis are present; no strong data that steroids (oral or intranasal) are significantly beneficial for isolated post-COVID-19 anosmia
- Recommend against antibiotics and Vitamin A drops ⁵ (Addison A, 2021) ⁶ (Hopkins C, 2021)
- Smell/olfactory retraining and advice ([Appendix A](#)):
 - The act of regularly sniffing or exposing oneself to robust aromas with the intention of regaining a sense of smell

Consults to Consider

- Speech Language Pathology or Occupational Therapy: olfactory retraining, as well as additional education and implementation strategies to support safety considerations related to impaired smell
- Ear, Nose, Throat (ENT) or Speech Language Pathology: concurrent dysphonia or dysphagia
- Neurology: previous head injury or neurologic signs and symptoms
- Whole Health System approach: Whole Health Coaching

¹ National Institute for Health and Care Excellence (NICE) UK, <https://www.nice.org.uk/guidance/ng188>

² Yoo S. Factors Associated with Post-Acute Sequelae of SARS-CoV-2 (PASC) After Diagnosis of Symptomatic COVID-19 in the Inpatient and Outpatient Setting in a Diverse Cohort. J Gen Intern Med. 2022 Jun;37(8):1988-1995. doi: 10.1007/s11606-022-07523-3.

³ Douaud G. SARS-CoV-2 is associated with changes in brain structure in UK Biobank. Nature. 2022 Apr;604(7907):697-707. doi: 10.1038/s41586-022-04569-5

⁴ Premraj L. Mid and long-term neurological and neuropsychiatric manifestations of post-COVID-19 syndrome: A meta-analysis. J Neurol Sci. 2022 Mar 15;434:120162. doi: 10.1016/j.jns.2022.120162

⁵ Addison A. Clinical Olfactory Working Group consensus statement on the treatment of postinfectious olfactory dysfunction. J Allergy Clin Immunol. 2021 May;147(5):1704-1719. doi: 10.1016/j.jaci.2020.12.641

⁶ Hopkins C. Management of new onset loss of sense of smell during the COVID-19 pandemic - BRS Consensus Guidelines. Clin Otolaryngol. 2021 Jan;46(1):16-22. doi: 10.1111/coa.13636.

AUTONOMIC NERVOUS SYSTEM DYSREGULATION

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Autonomic nervous system dysregulation may be present even after mild cases of COVID-19. Up to 48% of patients reported dizziness or light headedness greater than 4 weeks post-COVID-19.⁷ (NICE, 2021) Of 180 post-COVID-19 patients, 7.2% experienced dizziness and 61% of patients had autonomic dysfunction.⁸ (Stella A, 2022)

Things to Keep in Mind

- Signs and symptoms may manifest as palpitations, lightheadedness, dizziness, fatigue, blurry vision, falling, presyncope and decreased exercise tolerance
- Consider systemic conditions such as deconditioning, dehydration, anemia, hypoxia, anxiety, Parkinson's Disease, persistent fever, lung disease, and cardiac disease, including sinus node dysfunction, myocarditis, and heart failure
- Consider orthostatic hypotension versus orthostatic tachycardia
- Review medications such as diuretics, antidepressants, certain beta blockers
- Assess pregnancy/lactation status, review teratogenic medications

Evaluation

Labs to Consider

- Comprehensive Metabolic Panel (CMP)
- Glucose (hypoglycemia)
- Complete Blood Count (CBC) (anemia)

Tests to Consider

- Electrocardiogram (EKG) (arrhythmia)
- Evaluate for orthostatic blood pressure (lying, standing) for up to 10 minutes:
 - Have patient lie down for 5 minutes and then measure blood pressure (BP) and heart rate (HR). Have patient stand up and measure BP and HR after every 2 minutes for 10 minutes
 - If there is a drop of systolic blood pressure (SBP) by 20 points or diastolic blood pressure (DBP) by 10 points, then it is considered positive for orthostatic hypotension
 - If the HR increases by >30 BPM without hypotension, then it is positive for orthostatic tachycardia

PACT Management to Consider

- ICD-10 Code: U09.9, Post-COVID-19 condition, unspecified
- [Post-Acute Sequelae of COVID-19 and Cardiovascular Autonomic Dysfunction: What Do We Know?](#)
- Consider using Composite Autonomic Symptom Score (COMPASS 31)⁹ (Sletten DM, 2012) for evaluating symptom trends ([Appendix D](#))
- Hydration immediately; for postural orthostatic tachycardia syndrome (POTS) consider 64 ounces of water intake daily
- Avoid or limit alcohol intake as it can worsen or precipitate orthostatic hypotension
- Use of salt with caution especially if there is history of left ventricular dysfunction (LVD); POTS recommendation is 3000-5000 mg per day
- Avoid strenuous activity in hot weather
- Start with recumbent or semi-recumbent exercise (rowing, swimming, cycling) with gradual transition to upright exercise (walking, jogging, elliptical) as orthostatic intolerance improves
- Titrated return to activity program ([Appendix B](#))
- Lifestyle modification including slowly getting out of bed before standing and use of compression stockings
- Frequent, small, balanced meals with whole foods, protein, vegetables, and fruits, and high fiber for POTS
- [Biofeedback](#)

Consults to Consider

- Cardiology:
 - If assessment is negative but high clinical suspicion for POTS
- Physical Therapy:
 - Titrated return to individualized activity program ([Appendix B](#)) and energy conservation techniques
- Occupational Therapy:
 - Energy conservation techniques
 - Activities of daily living (ADLs)
- Whole Health System approach:
 - [Biofeedback](#), yoga, health coaching
- Nutrition

⁷ National Institute for Health and Care Excellence (NICE) UK, <https://www.nice.org.uk/guidance/ng188>

⁸ Stella A. Autonomic dysfunction in post-COVID patients with and without neurological symptoms: a prospective multidomain observational study. *Journal of Neurology*. 2022 Feb;269(2):587-596. doi: 10.1007/s00415-021-10735-y

⁹ Sletten DM. COMPASS 31: a refined and abbreviated Composite Autonomic Symptom Score. *Mayo Clin Proc*. 2012 Dec;87(12):1196-201. doi: 10.1016/j.mayocp.2012.10.013. PMID: 23218087; PMCID: PMC3541923

CHEST PAIN

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Chest pain is a common symptom with almost 5% of those diagnosed with COVID-19 reporting chest pain >12 weeks after initial illness.¹⁰ (Whitaker M, 2022) The usual conditions are considered in the differential for recurrent chest pain.¹¹ (Gluckman T, 2022) In particular after COVID-19, cardiovascular conditions including myocardial infarction (MI) and myocarditis were noted to be higher compared to those without COVID-19, even in younger patients.¹² (Xie Y, 2022) The reason is unclear but may be related to virally mediated vascular endothelial injury or indirectly from the immune response.¹³ (Bellan M, 2021) Furthermore, there seems to be a number of people with atypical chest pain that may be part of a post-COVID-19 pain syndrome.

Things to Keep in Mind

- The evaluation is similar to routine evaluation for chest pain
- Maintain a high degree of suspicion for coronary artery disease (CAD), myocarditis/pericarditis, and venous thromboembolism (VTE) given elevated risk after COVID-19 infection
- Assess pregnancy/lactation status, review teratogenic medications

Evaluation

Labs to Consider

- None

Tests to Consider

- Additional testing as indicated by history and exam

PACT Management to Consider

- ICD-10 Code: U09.9, Post-COVID-19 condition, unspecified
- For pleuritic pain or costochondritis:
 - [Diaphragmatic breathing](#)
 - Stretching
 - 1 or 2 weeks of low dose non-steroidal anti-inflammatory drugs (NSAID)
 - If signs and symptoms worsen, consider gastrointestinal causes like esophagitis or esophageal spasm

Consults to Consider

- Cardiology: if no improvement with initial therapies described, or concern for underlying cardiac disease or complications (myocarditis, heart failure, ischemia/CAD, arrhythmia)
- Physical Therapy: for accessory muscle usage/rib excursion after ruling out cardiac issues
- Chiropractic Care
- Whole Health System approach: health coaching, acupuncture

¹⁰ Whitaker M. Persistent COVID-19 symptoms in a community study of 606,434 people in England. Nature Communications 13, 1957 (2022). <https://doi.org/10.1038/s41467-022-29521-z>

¹¹ Gluckman T. 2022 ACC Expert Consensus Decision Pathway on Cardiovascular Sequelae of COVID-19 in Adults: Myocarditis and Other Myocardial Involvement, Post-Acute Sequelae of SARS-CoV-2 Infection and Return to Play. J American College Cardiology. 2022 May, 79 (17) 1717–1756. <https://doi.org/10.1016/j.jacc.2022.02.003>

¹² Xie Y. Long-term cardiovascular outcomes of COVID-19. Nature Medicine 28, 583–590 (2022). <https://doi.org/10.1038/s41591-022-01689-3>

¹³ Bellan M. Respiratory and Psychophysical Sequelae Among Patients With COVID-19 Four Months After Hospital Discharge. JAMA Network Open. 2021;4(1):e2036142. doi:10.1001/jamanetworkopen.2020.36142

COGNITIVE IMPAIRMENT

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Cognitive impairment is found in up to 60% of patients greater than 4 weeks after COVID-19. In some studies, 23% of patients reported persistent signs and symptoms more than 8 months after COVID-19.¹⁴ (NICE, 2021)

Things to Keep in Mind

- Patient signs and symptoms¹⁵ (AAPM&R, 2022)
 - Attention - Brain fog, lost train of thought, concentration problems
 - Processing Speed - Slowed thoughts
 - Motor Function - Slowed movements
 - Language - Word finding problems, reduced fluency
 - Memory - Poor recall, forgetting tasks
 - Mental Fatigue - Exhaustion, brain fog
 - Executive Function - Poor multitasking and/or planning
 - Visuospatial - Blurred vision, neglect
- Perform a workup aiming to address reversible causes of dementia or cognitive impairment
- Consider screenings for mental health, substance use and sleep disturbances
- Assess pregnancy/lactation status, review teratogenic medications

Evaluation

Labs to Consider

- B12
- Thyroid stimulating hormone (TSH)
- Glucose
- Rapid plasma reagin (RPR)

Tests to Consider

- For purely cognitive impairment without other neurologic signs and symptoms, magnetic resonance imaging (MRI) or head computed tomography (CT) is not routinely indicated

PACT Management to Consider

- ICD-10 Code: U09.9, Post-COVID-19 condition, unspecified
- Medication reconciliation
- [Diaphragmatic breathing](#)

Consults to Consider

- Occupational Therapy, Speech Language Pathology or Primary Care Mental Health Integration (PCMHI): perform Montreal Cognitive Assessment (MOCA), Mini-Mental State Exam (MMSE), or Saint Louis University Mental Status (SLUMS)
- Occupational Therapy and Speech Language Pathology: perform cognitive assessment, cognitive rehabilitation, functional assessment and evaluate impact upon activities of daily living (ADLs), work, school, and hobbies
- PCMHI: address mental health concerns associated with coping with new signs and symptoms, and provide cognitive behavioral therapy for insomnia (CBT-I)
- Nutrition: Nutrition optimization, food diary, and glucose regulation
- Whole Health System approach: mindfulness/meditation, Tai Chi, acupuncture, health coaching
- Neurology: At initial visit if there are focal signs and symptoms or “red flags” to suggest a systemic disease, OR potentially after 12-24 weeks if signs and symptoms worsen or persist, affecting daily function and quality of life despite cognitive rehabilitation

¹⁴ National Institute for Health and Care Excellence (NICE) UK, <https://www.nice.org.uk/guidance/ng188>

¹⁵ American Academy of Physical Medicine and Rehabilitation. <https://www.aapmr.org/members-publications/covid-19/pasc-guidance>

COUGH

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Cough appears to be more common and duration may be longer after COVID-19.¹⁶ (NICE, 2021) Cough often persists for weeks to months after resolution of initial illness with 5-30% of patients reporting cough at 3 months.¹⁷ (Jutant EM, 2022)¹⁸ (Goertz YMJ, 2020) There are likely multiple reasons potentially related to development of fibrosis and underlying conditions such as asthma. For many people the cause is a post-infectious cough, which is often managed like cough-variant asthma. The evaluation will be similar to subacute and chronic cough for which the typical time courses are 3-8 weeks and >8 weeks, respectively.

Things to Keep in Mind

- Post-infectious cough is likely a common cause which means it should resolve with time
- Worsening cough could suggest secondary bacterial pneumonia or organizing pneumonia, which are uncommon, so always correlate with dyspnea and hypoxia
- Assess classic contributors such as gastroesophageal reflux disease (GERD), post-nasal drip, and pulmonary fibrosis
- Assess pregnancy/lactation status, review teratogenic medications

Evaluation

Labs to Consider

- None

Tests to Consider

- If greater than 8 weeks post COVID-19, consider:
 - Chest X-Ray
 - Pulmonary Function Test (including pre-/post-bronchodilator)
 - Chest CT

PACT Management to Consider

- ICD-10 Code: U09.9, Post-COVID-19 condition, unspecified
- Medication reconciliation to rule out iatrogenic causes such as angiotensin-converting enzyme inhibitors (ACE-i)
- Similar to cough-variant asthma with albuterol as needed, inhaled corticosteroid (ICS), and ICS/long-acting beta-agonist (LABA) for progressively severe or more frequent episodes
- Should limit to 2–3-month empiric trial and re-evaluate if not resolved
- Sputum management using hydration, expectorants, and airway clearance devices
- [Diaphragmatic Breathing](#)

Consults to Consider

- Pulmonary: if continued cough >12 weeks despite initial treatment
- Whole Health System approach: biofeedback, mind body skills, health coaching, yoga, Tai Chi

¹⁶ National Institute for Health and Care Excellence (NICE) UK, <https://www.nice.org.uk/guidance/ng188>

¹⁷ Jutant EM. Respiratory symptoms and radiological findings in post-acute COVID-19 syndrome. ERJ Open Res 2022;8. 10.1183/23120541.00479-2021

¹⁸ Goertz YMJ. Persistent symptoms 3 months after a SARS-CoV-2 infection: the post-COVID-19 syndrome? ERJ Open Res. 2020 Oct 26;6(4). doi: 10.1183/23120541.00542-2020.

DYSPNEA

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Post-COVID-19 dyspnea is common with multiple etiologies including cardiac, pulmonary, and neuromuscular issues. Prevalence is likely proportional to initial severity with dyspnea reported in ~5-10% of mild (outpatient) cases,¹⁹ (Sudre CH, 2021)²⁰ (Nehme M, 2021) but up to 15-50% of those hospitalized.²¹ (Carfi A, 2020)²² (Froidure A, 2021)²³ (Jutant EM, 2022) Patients who initially had mild COVID-19, and did not experience hypoxemia or require hospitalization, are less likely to have post-acute pulmonary function or imaging abnormalities.²⁴ (AAPM&R, 2022)

Things to Keep in Mind

- A functional assessment evaluating ADLs and recovery time after activity is helpful for triaging severity and creating a titrated return to individualized activity program ([Appendix B](#))
- Differentiate between dyspnea at rest (forgetting to breathe), dyspnea with movement (bending forward), dyspnea with exertion with or without hypoxemia, and post-exertional malaise (disproportionately long recovery time after exertion)
- Consider evaluation for pulmonary embolism (PE)²⁵ (Li P, 2021), coronary artery disease (CAD)²⁶ (Xie Y, 2022), interstitial lung disease and myocarditis²⁷ (Puntmann VO, 2020)²⁸ (Daniels CJ, 2021) if clinically indicated given higher rates after COVID-19
- Assess pregnancy/lactation status, review teratogenic medications

Evaluation

Labs to Consider

- Complete blood count (CBC)
- If on oral contraceptive pill (OCP) with relevant Wells or modified Geneva score, consider D-dimer to screen for pulmonary thrombosis
- Troponin if suspicious for myocarditis

Tests to Consider

- Assess oxygen saturation at rest and with exertion
- If lasting more than 8 weeks, consider:
 - 2-view chest x-ray (CXR)
 - Electrocardiogram (EKG)
 - Pulmonary function tests (PFT)

PACT Management to Consider

- ICD-10 Code: U09.9, Post-COVID-19 condition, unspecified
- Supplemental oxygen
- Pharmacologic therapies, including oral corticosteroids, inhaled bronchodilators, and inhaled corticosteroids, are not *routinely* recommended for breathing discomfort in the absence of a specific diagnosis such as asthma
- [Heart healthy diet](#)
- [Stress management](#)
- [Diaphragmatic Breathing](#)

Consults to Consider

- Pulmonary: Persistent hypoxia at 6 weeks or abnormal work-up; otherwise >12 weeks with persistent symptoms
- Cardiology: Abnormal EKG, stress test, or highly suspicious for cardiac etiology
- Pulmonary rehabilitation: After prerequisite clinical assessment for CAD, hypoxia, and participation (orthostatic hypotension) while excluding post-exertional malaise
- Ear, Nose, Throat (ENT) or Speech Language Pathology: concurrent dysphonia or dysphagia
- Physical Therapy: titrated return to individualized activity program ([Appendix B](#)) if no post-exertional malaise
- Occupational Therapy: regulated breathing during daily task engagement in home and the community
- Whole Health System approach: health coaching

¹⁹ Sudre CH. Attributes and predictors of long COVID. *Nature Medicine*. 2021 Apr;27(4):626-631. doi: 10.1038/s41591-021-01292-y

²⁰ Nehme M, CoviCare Study T. Prevalence of Symptoms More Than Seven Months After Diagnosis of Symptomatic COVID-19 in an Outpatient Setting. *Annals of Internal Medicine* 2021;174:1252-60. doi: 10.7326/M21-0878.

²¹ Carfi A. Persistent Symptoms in Patients After Acute COVID-19. *JAMA* 2020;324:603-5.

²² Froidure A, Mahsouli A, Liistro G, et al. Integrative respiratory follow-up of severe COVID-19 reveals common functional and lung imaging sequelae. *Respiratory Medicine* 2021;181:106383. doi: 10.1016/j.rmed.2021.106383.

²³ Jutant EM. Respiratory symptoms and radiological findings in post-acute COVID-19 syndrome. *European Respiratory Journal Open Res* 2022;8 (2):00479-2021. doi: 10.1183/23120541.00479-2021.

²⁴ American Academy of Physical Medicine and Rehabilitation (AAPM&R). <https://www.aapmr.org/members-publications/covid-19/pasc-guidance>

²⁵ Li P. Factors Associated With Risk of Postdischarge Thrombosis in Patients With COVID-19. *JAMA Network Open*. 2021 Nov 1;4(11):e2135397. doi: 10.1001/jamanetworkopen.2021.35397

²⁶ Xie Y. Long-term cardiovascular outcomes of COVID-19. *Nat Med* 28, 583–590 (2022). <https://doi.org/10.1038/s41591-022-01689-3>

²⁷ Puntmann VO. Outcomes of Cardiovascular Magnetic Resonance Imaging in Patients Recently Recovered From Coronavirus Disease 2019 (COVID-19). *JAMA Cardiology*. 2020 Nov 1;5(11):1265-1273. doi: 10.1001/jamacardio.2020.3557

²⁸ Daniels CJ. Prevalence of Clinical and Subclinical Myocarditis in Competitive Athletes With Recent SARS-CoV-2 Infection: Results From the Big Ten COVID-19 Cardiac Registry. *JAMA Cardiology*. 2021;6(9):1078–1087. doi:10.1001/jamacardio.2021.2065

FATIGUE AND ACTIVITY INTOLERANCE

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Fatigue is one of the most common Long COVID related signs and symptoms in multiple studies, with an incidence of 63% in those hospitalized²⁹ (AAPM&R, 2022) and 46% in those not hospitalized.³⁰ (Stavem K, 2021)

Things to Keep in Mind

- Assess the Veteran's prior level of function (independence with activities of daily living (ADLs), working hobbies, exercising), current level of function, and recovery time from activities
- Veteran may experience post-exertional malaise, making a titrated return to individualized activity ([Appendix B](#)) important
- Screen for mental health, substance disorder, sleep disturbances
- Medication reconciliation
- Women more likely to experience fatigue at 6 months³¹ (Xiong Q, 2021)
- Assess pregnancy/lactation status, review teratogenic medications

Evaluation

Labs to Consider

- Complete blood count (CBC)
- Thyroid stimulating hormone (TSH)
- B12
- Vitamin D
- Comprehensive Metabolic Panel (CMP)
- Hemoglobin A1C
- Consider:
 - Human immunodeficiency virus (HIV)
 - Hepatitis C virus (HCV)

Tests to Consider

- Ambulatory pulse oximetry
- 30 second sit to stand to evaluate functional lower extremity strength and endurance, and provide information about fall risk, activity tolerance, activity endurance, and functional mobility ([Appendix C](#))²⁹ (AAPM&R, 2022)
- Evaluate other organ systems that may have been affected by COVID-19 that impact exercise participation (e.g., cardiac, pulmonary)

PACT Management to Consider

- ICD-10 Code: U09.9, Post-COVID-19 condition, unspecified
- Titrated return to individualized activity program ([Appendix B](#))
- [Diaphragmatic Breathing](#)
- [Cognitive Behavioral Therapy \(CBT\) for Insomnia](#)
- Replete B12 if low
- Replete Vitamin D if low
- Consider Fish oil – 1000mg (500mg DHA/EPA) capsule combined eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) daily with food (avoid if on blood thinners or experiencing gastroesophageal reflux disease (GERD))

Consults to Consider

- Occupational Therapy for a titrated return to individualized activity program ([Appendix B](#)) and energy conservation techniques
- Physical Therapy for titrated return to individualized activity program ([Appendix B](#))
- Physical Medicine & Rehabilitation (PM&R)
- Cardiology
- Pulmonology
- Mental Health
- Nutrition to discuss an anti-inflammatory lifestyle and diet history.
- Whole Health System approach: mindfulness, health coaching, yoga, Tai Chi, biofeedback

²⁹American Academy of Physical Medicine and Rehabilitation (AAPM&R). <https://www.aapmr.org/members-publications/covid-19/pasc-guidance>

³⁰ Stavem K. Prevalence and Determinants of Fatigue after COVID-19 in Non-Hospitalized Subjects: A Population-Based Study. Int J Environ Res Public Health. 2021 Feb 19;18(4):2030. doi: 10.3390/ijerph18042030

³¹ Xiong Q. Clinical sequelae of COVID-19 survivors in Wuhan, China: a single-centre longitudinal study. Clin Microbiol Infect. 2021 Jan;27(1):89-95. doi: 10.1016/j.cmi.2020.09.023

HEADACHES

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Up to 79% of patients reported headache at greater than 4 weeks post-COVID-19³² (NICE, 2022), though this improved with time and 10.6% reported ongoing headaches at 90 days, and 8.4% \geq 180 days after symptom onset/hospital discharge.³³ (Fernández-de-Las-Peñas C, 2021)

Things to Keep in Mind

- Consider screening for mental health, substance use disorder, sleep disturbances, traumatic brain injury (TBI)
- Neurological examination warranted
- Medication reconciliation
- Consider the following:
 - Pre-COVID-19 episodic migraine now chronic post-COVID-19
 - Delayed onset COVID-19 headache
 - Persistent headache with migraine features onset with COVID-19
 - Sinus congestion
 - Cervical and upper back muscle tightness
 - Increased stress level
 - Medication rebound headache
- Assess pregnancy/lactation status, review teratogenic medications

Evaluation

Labs to Consider

- None

Tests to Consider

- No recommendations for imaging if headache only

PACT Management to Consider

- ICD-10 Code: U09.9, Post-COVID-19 condition, unspecified
- [Treating Headaches Handout for Patients](#)
- Over the counter (OTC) and prescription analgesic review
- Lifestyle management and evaluation (sleep, exercise, nutrition, headache diary)
- Consider Riboflavin 400mg every morning with food
- Consider Magnesium Oxide 420mg every evening
- Regulate glucose levels
- Recommend 64 ounces of water daily
- [Diaphragmatic Breathing](#)

Consults to Consider

- Neurology: if no improvement despite initial management or if abnormal neurological examination present
- Nutrition: to discuss an [anti-inflammatory diet](#) and [headache elimination diet](#)
- Whole Health System approach: biofeedback, mindfulness, health coaching, yoga, acupuncture, Tai Chi
- Chiropractic Care
- Osteopathy

³² NICE <https://www.nice.org.uk/guidance/ng188/resources/covid19-rapid-guideline-managing-the-longterm-effects-of-covid19-pdf-51035515742>

³³ Fernández-de-Las-Peñas C. Headache as an acute and post-COVID-19 symptom in COVID-19 survivors: A meta-analysis of the current literature. Eur J Neurol. 2021 Nov;28(11):3820-3825. doi: 10.1111/ene.15040.

MENTAL HEALTH (ANXIETY, DEPRESSION, PTSD)

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Anxiety, depression, sleep disturbances and post-traumatic stress disorder (PTSD) have been reported in 30 - 40% of COVID-19 survivors, similar to survivors of other pathogenic coronaviruses.³⁴ (Nalbandian A, 2021) These signs and symptoms may be exacerbated by specific COVID-19 related or pandemic-associated events such as loneliness, job loss, childcare issues, lack of typical recreational activities, and relationship strain.

Things to Keep in Mind

- Given the overall increase in suicides during the pandemic and the increased risk for mental health symptoms following COVID-19, consider assessment for suicidality
- Complete usual mental health screens and discern whether reported signs and symptoms are temporally related to Long COVID (increase in previous or new signs and symptoms)
- Normalize and validate signs and symptoms as appropriate
- Assess contribution from sleep disturbances, physical function changes, substance use, and other lifestyle changes that may affect mental health
- Consider the following:
 - Adjustment Disorder following change in health or role
 - Generalized Anxiety Disorder
 - Panic Disorder
 - Obsessive Compulsive Disorder
 - Depression
 - Anxiety related to air hunger
 - Acute Stress Disorder
 - Post-Traumatic Stress Disorder
 - Post Intensive Care Syndrome
 - Sleep Disorders to include insomnia
 - Substance Use Disorder
 - Coping with stigma
 - Survivor's guilt
 - Problems in relationship
- Assess pregnancy/lactation status, review teratogenic medications

Evaluation

Labs to Consider

- Routine labs for mental health evaluation

Tests to Consider

- None

PACT Management to Consider

- ICD-10 Code: U09.9, Post-COVID-19 condition, unspecified
- [Explore Veteran's hope to address signs and symptoms using Veteran's mission, aspiration, and purpose.](#)
- Primary Care Mental Health Integration (PCMHI)
- [Veterans Crisis Line](#) – contact options:
 - Dial 988 then Press 1
 - Dial 800-273-8255 then press 1
 - Text 838255
- [COVID-19 Coach App](#) – Stress management
- [Insomnia Coach App](#) - Path to better sleep
- [Diaphragmatic Breathing](#)
- [Guided Meditation](#) – Audio files
- Consider antidepressant
- Consider Fish oil – 1000mg (500mg DHA/EPA) capsule combined eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) daily with food (avoid if on blood thinners or experiencing gastroesophageal reflux disease (GERD))

Consults to Consider

- Explore interest in Mental Health follow up
 - Mental Health consult for high complexity
- Long COVID Support Groups
- Nutrition
- Physical Therapy: titrated return to individualized activity program ([Appendix B](#))
- Peer Support Specialists
- Whole Health System approach: health coach, Tai Chi, yoga, acupuncture/battlefield acupuncture/national acupuncture detox
- Chaplain

³⁴ Nalbandian A. Post-acute COVID-19 syndrome. Nat Med. 2021 Apr;27(4):601-615. doi: 10.1038/s41591-021-01283-z

OTHER POTENTIAL CONDITIONS: CARDIOMETABOLIC AND AUTOIMMUNE

This provides suggestions as you engage in shared health care decision-making with Veterans. It is not intended to replace clinical judgement.

Given evidence that COVID-19 may increase the risk for Diabetes, renal impairment, cardiovascular complications and autoimmune conditions, a history of infection should be considered along with other factors in deciding who should be screened for these conditions.

| | Epidemiology | Recommendation |
|-----------------------|---|--|
| Cardiovascular | Increased risk of myocardial infarction (MI), cardiovascular accident (CVA), congestive heart failure (CHF), myocarditis ³⁵ (Xie Y, 2022) | High awareness for cardiovascular complications ³⁶ (Gluckman T, 2022) |
| Kidney Disease | Increased risk of significant decline in estimated glomerular filtration rate (eGFR), proportional to severity of disease, though present even in those not admitted to the hospital ³⁷ (Bowe B, 2021) | <ul style="list-style-type: none"> ■ If not already assessed, evaluate kidney function glomerular filtration rate (GFR) using creatine or cystatin C at 3-6 months after resolution of COVID-19 ■ Compare results to pre-COVID-19 GFR if available |
| Diabetes | Compared with those who never had COVID-19, Veterans who have had COVID-19 are at greater risk of developing type 2 Diabetes up to a year later, even after a mild SARS-CoV-2 infection. ³⁸ (Xie Y, 2022) ³⁹ (Wander P, 2022) | <ul style="list-style-type: none"> ■ Ask all Veterans who had severe COVID-19 about signs and symptoms of diabetes at every routine visit. Consider asking Veterans who had mild or asymptomatic COVID-19. ■ A baseline A1c test should be done post-COVID-19 for all Veterans ■ For symptomatic Veterans: <ul style="list-style-type: none"> ● Veterans experiencing post-COVID-19 signs and symptoms with pre-existing diabetes should have an additional A1c test at 6 months post-infection ● Veterans experiencing post-COVID-19 signs and symptoms without pre-diabetes but with significant risk factors for diabetes- such as strong family history and obesity-can be considered for an A1c test at 6 months post-infection ● Routine laboratory testing for other indications should include a Fasting Blood Glucose (FBS) when possible ● If there has been a significant increase (>0.5%) in A1c from baseline, obtain a repeat A1c or FBS earlier than 6 months post-infection |
| Autoimmune | Up to 25% may develop antinuclear antibody (ANA) positivity, but the titers were low and deemed not clinically significant. ⁴⁰ (Lerma L, 2020) The serology of 61 patients 5 weeks after COVID-19 had no increased incidence of anti-cyclic citrullinated peptides (CCP) positivity. ⁴¹ (Derksen V, 2021) | Coronaviruses seem to typically cause signs and symptoms of arthralgia and myalgia. ⁴² (Zacharias H, 2021) ⁴³ (Cui D, 2022) If a patient develops clinical features of inflammatory arthritis following COVID-19, the diagnostic work-up should be similar to a patient with new onset rheumatoid arthritis (RA) in an infection naive patient. ⁴⁴ (Sapkota H, 2022) |

³⁵ Xie Y. Long-term cardiovascular outcomes of COVID-19. Nat Med 28, 583–590 (2022). <https://doi.org/10.1038/s41591-022-01689-3>

³⁶ Gluckman. ACC Expert Consensus Decision Pathway on Cardiovascular Sequelae of COVID-19 in Adults, 2022. doi: 10.1016/j.jacc.2022.02.003

³⁷ Bowe B. JASN November 2021, 32 (11) 2851-2862; DOI: <https://doi.org/10.1681/ASN.2021060734>

³⁸ Xie Y. Risks and burdens of incident diabetes in long COVID: a cohort study. Lancet Diabetes Endocrinol. 2022 May;10(5):311-321. doi: 10.1016/S2213-8587(22)00044-4

³⁹ Wander P. The Incidence of Diabetes Among 2,777,768 Veterans with and Without Recent SARS-CoV-2 Infection. Diabetes Care 1 April 2022; 45 (4): 782–788. <https://doi.org/10.2337/dc21-1686>

⁴⁰ Lerma L. Prevalence of autoantibody responses in acute coronavirus disease 2019 (COVID-19). J Transl Autoimmun, 2020. 10.1016/j.jtauto.2020.100073

⁴¹ Derksen V. Onset of rheumatoid arthritis after COVID-19: coincidence or connected? Ann Rheum Dis, 2021. <http://dx.doi.org/10.1136/annrheumdis-2021-219859>

⁴² Zacharias H. Rheumatological complications of Covid 19. Autoimmun Rev, 2021. 20(9): 10.1016/j.autrev.2021.102883

⁴³ Cui D. Rheumatic Symptoms Following Coronavirus Disease 2019 (COVID-19): A Chronic Post-COVID-19 Condition, Open Forum Infectious Diseases, Volume 9, Issue 6, June 2022, ofac170, <https://doi.org/10.1093/ofid/ofac170>

⁴⁴ Sapkota H. Long COVID from rheumatology perspective - a narrative review. Clin Rheumatol, 2022. 41(2): p. 337-348. 10.1007/s10067-021-06001-1

APPENDIX A: OLFACTORY TRAINING

This section provides details about the Olfactory Training at the Veterans Affairs Otolaryngology Department in Atlanta, GA

1. Actively smell or sniff
2. Four familiar scents
3. Think about your memory of the odor while smelling the odor
4. In random order, sniff for a total of 20-60 seconds for each odor
5. Rest for 30 seconds between each scent
6. Sniff the four scents, 2 to 4 times a day, each, for 24-36 weeks
7. Change the odorants used every 12 weeks

The stimulating smells used are often in commercially available smell kits are often selected from major smell categories, such as aromatic, flowery, fruity, and resinous.

APPENDIX B: FATIGUE AND ACTIVITY INTOLERANCE

This section provides details on the titrated return to individualized activity program including baseline activity tolerance and paced graded activity.

Titrated Return to Individualized Activity Program

Mild Fatigue: Patients should try to continue all household and community activities that have been tolerated with a slow return to higher intensity activities and exercise. The “rule of tens” may be helpful.

Moderate Fatigue: It’s recommended to continue household and limited community activities that have been tolerated. Patients should begin an activity or aerobic exercise program with exertion at sub-maximal levels (rate of perceived exertion (RPE) 9–11/Very Light-Light).

Severe Fatigue: Severe fatigue or significant post-exertional malaise: Continue any house-hold activities that have been tolerated without symptom exacerbation. Patients can begin a physical activity program, which should initially consist of upper and lower extremity stretching and light muscle strengthening before any targeted aerobic activity. Once tolerated, patients can begin an activity or aerobic exercise program at submaximal levels, RPE 7–9/Extremely to Very Light.

Activities or exercise can be slowly advanced as the patient tolerates in all levels of fatigue. Harm can be done if patients are pushed beyond what they can tolerate. If signs and symptoms worsen after increasing activity level in any severity of fatigue (which may be delayed until the evening and/or days after the activity/exercise session), patient should return to prior tolerated level of activity.

Baseline Activity Tolerance

Measure how long low intensity tasks such as walking, light exercises, and daily activities (e.g., self-care tasks, light housework) can be engaged in without resulting in immediate or delayed fatigue. Do this for both “good” and “bad” days for 3 days. Average the three trials and subtract a fifth. The result will be your activity duration starting point.

Table 1: Activity Duration Baseline

| Time 1 | Time 2 | Time 3 | Average | 4/5 Average |
|--------|--------|--------|---------|-------------|
| 19 min | 17 min | 21 min | 19 min | 15 min |

Paced Graded Activity

Start with low intensity daily activities. Keep in mind that patients with different symptom severity will be able to tolerate different levels of activity. Transition over the course of days to months based on response, with a 10-20% increase every 1-2 weeks being a common marker. Work to keep a consistent schedule vs adapting day by day based on symptom levels or life demands. It is important to remember to not try to over-exert oneself on days they are feeling well, as this may worsen signs and symptoms.

To increase activity level over time:

1. First focus on increasing the FREQUENCY of activity
2. Then work to increase the DURATION of activity
3. When able to engage reliably in low intensity activity consistently throughout the day without flares of fatigue, then moderate and eventually higher INTENSITY activity can be added.

The following table gives an example of what this could look like in practice. Help your Veteran to set their own starting point and progression based on their activity tolerance and response.

Table 2: Pace Graded Activity

| Week | Intensity | Activity Duration (min) | Rest Duration (min) |
|-------------|------------------|--------------------------------|----------------------------|
| 1-2 | Low | 15 | 50 |
| 3-4 | Low | 15 | 40 |
| 5-6 | Low | 15 | 30 |
| 7-8 | Low | 20 | 30 |
| 9-10 | Low | 25 | 25 |
| 11-12 | Low | 30 | 20 |
| 13-14 | Low | 35 | 15 |
| 15-16 | Low ; Moderate | 30 ; 5 | 15 |
| 17-18 | Low ; Moderate | 25 ; 10 | 15 |
| 19-20 | Low ; Moderate | 20 ; 15 | 15 |

APPENDIX C: 30 SECOND SIT TO STAND TEST

The [30 second chair stand test \(30CST\)](#) is a measurement that assess functional lower extremity strength in older adults. It is part of the Fullerton Functional Fitness Test Battery. This test was developed to overcome the floor effect of the 5 or 10 repetition sit to stand test in older adults.

Instructions

1. Instruct the patient:
 - a. Sit in the middle of the chair.
 - b. Place your hands on the opposite shoulder crossed, at the wrists.
 - c. Keep your feet flat on the floor.
 - d. Keep your back straight and keep your arms against your chest.
 - e. On “Go,” rise to a full standing position, then sit back down again.
 - f. Repeat this for 30 seconds.
2. On the word “Go,” begin timing. If the patient must use their arms to stand, stop the test. Record “0” for the number and score.
3. Count the number of times the patient comes to a full standing position in 30 seconds. If the patient is over halfway to a standing position when 30 seconds have elapsed, count it as a stand.
4. Record the number of times the patient stands in 30 seconds.

APPENDIX D: COMPOSITE AUTONOMIC SYMPTOM SCORE (COMPASS 31)

[COMPASS 31](#) is a quantitative measure of autonomic symptoms.

Assessment

1. In the past year, have you ever felt faint, dizzy, “goofy”, or had difficulty thinking soon after standing up from a sitting or lying position?
 - 1 Yes
 - 2 No (if you marked No, please skip to question 5)
2. When standing up, how frequently do you get these feelings or symptoms?
 - 1 Rarely
 - 2 Occasionally
 - 3 Frequently
 - 4 Almost Always
3. How would you rate the severity of these feelings or symptoms?
 - 1 Mild
 - 2 Moderate
 - 3 Severe
4. In the past year, have these feelings or symptoms that you have experienced:
 - 1 Gotten much worse
 - 2 Gotten somewhat worse
 - 3 Stayed about the same
 - 4 Gotten somewhat better
 - 5 Gotten much better
 - 6 Completely gone
5. In the past year, have you ever noticed color changes in your skin, such as red, white, or purple?
 - 1 Yes
 - 2 No (if you marked No, please skip to question 8)
6. What parts of your body are affected by these color changes? (Check all that apply)
 - 1 Hands
 - 2 Feet
7. Are these changes in your skin color:
 - 1 Getting much worse
 - 2 Getting somewhat worse
 - 3 Staying about the same
 - 4 Getting somewhat better
 - 5 Getting much better
 - 6 Completely gone

8. In the past 5 years, what changes, if any, have occurred in your general body sweating?
- 1 I sweat much more than I used to
 - 2 I sweat somewhat more than I used to
 - 3 I haven't noticed any changes in my sweating
 - 4 I sweat somewhat less than I used to
 - 5 I sweat much less than I used to
9. Do your eyes feel excessively dry?
- 1 Yes
 - 2 No
10. Does your mouth feel excessively dry?
- 1 Yes
 - 2 No
11. For the symptom of dry eyes or dry mouth that you have had for the longest period of time, is this symptom:
- 1 I have not had any of these symptoms
 - 2 Getting much worse
 - 3 Getting somewhat worse
 - 4 Staying about the same
 - 5 Getting somewhat better
 - 6 Getting much better
 - 7 Completely gone
12. In the past year, have you noticed any changes in how quickly you get full when eating a meal?
- 1 I get full a lot more quickly now than I used to
 - 2 I get full more quickly now than I used to
 - 3 I haven't noticed any change
 - 4 I get full less quickly now than I used to
 - 5 I get full a lot less quickly now than I used to
13. In the past year, have you felt excessively full or persistently full (bloated feeling) after a meal?
- 1 Never
 - 2 Sometimes
 - 3 A lot of the time
14. In the past year, have you vomited after a meal?
- 1 Never
 - 2 Sometimes
 - 3 A lot of the time
15. In the past year, have you had a cramping or colicky abdominal pain?
- 1 Never
 - 2 Sometimes
 - 3 A lot of the time
16. In the past year, have you had any bouts of diarrhea?
- 1 Yes
 - 2 No (if you marked No, please skip to question 20)

17. How frequently does this occur?
- 1 Rarely
 - 2 Occasionally
 - 3 Frequently _____ times per month
 - 4 Constantly
18. How severe are these bouts of diarrhea?
- 1 Mild
 - 2 Moderate
 - 3 Severe
19. Are your bouts of diarrhea getting:
- 1 Much worse
 - 2 Somewhat worse
 - 3 Staying the same
 - 4 Somewhat better
 - 5 Much better
 - 6 Completely gone
20. In the past year, have you been constipated?
- 1 Yes
 - 2 No (if you marked No, please skip to question 24)
21. How frequently are you constipated?
- 1 Rarely
 - 2 Occasionally
 - 3 Frequently _____ times per month
 - 4 Constantly
22. How severe are these episodes of constipation?
- 1 Mild
 - 2 Moderate
 - 3 Severe
23. Is your constipation getting:
- 1 Much worse
 - 2 Somewhat worse
 - 3 Staying the same
 - 4 Somewhat better
 - 5 Much better
 - 6 Completely gone
24. In the past year, have you ever lost control of your bladder function?
- 1 Never
 - 2 Occasionally
 - 3 Frequently _____ times per month
 - 4 Constantly

25. In the past year, have you had difficulty passing urine?

- 1 Never
- 2 Occasionally
- 3 Frequently _____ times per month
- 4 Constantly

26. In the past year, have you had trouble completely emptying your bladder?

- 1 Never
- 2 Occasionally
- 3 Frequently _____ times per month
- 4 Constantly

27. In the past year, without sunglasses or tinted glasses, has bright light bothered your eyes?

- 1 Never (if you marked Never, please skip to question 29)
- 2 Occasionally
- 3 Frequently
- 4 Constantly

28. How severe is this sensitivity to bright light?

- 1 Mild
- 2 Moderate
- 3 Severe

29. In the past year, have you had trouble focusing your eyes?

- 1 Never (if you marked Never, please skip to question 31)
- 2 Occasionally
- 3 Frequently
- 4 Constantly

30. How severe is this focusing problem?

- 1 Mild
- 2 Moderate
- 3 Severe

31. Is the most troublesome symptom with your eyes (i.e. sensitivity to bright light or trouble focusing) getting:

- 1 I have not had any of these symptoms
- 2 Much worse
- 3 Somewhat worse
- 4 Staying about the same
- 5 Somewhat better
- 6 Much better
- 7 Completely gone

Raw Domain Scoring

The raw domain scores are derived by adding the points for the questions comprising each domain. Where an answer to a question is not assigned a point, the score for that answer is zero.

Table 3: Raw Domain Scoring

| Domain | Item | Answer | Points |
|-------------------------|------|--------|--------|
| Orthostatic Intolerance | 1 | 1 | 1 |
| | 2 | 2 | 1 |
| | | 3 | 2 |
| | | 4 | 3 |
| | 3 | 1 | 1 |
| | | 2 | 2 |
| | | 3 | 3 |
| | 4 | 1 | 3 |
| | | 2 | 2 |
| 3 | | 1 | |
| Vasomotor | 5 | 1 | 1 |
| | 6 | 1 | 1 |
| | | 2 | 1 |
| | 7 | 1 | 3 |
| | | 2 | 2 |
| 3 | 1 | | |
| Secretomotor | 8 | 1 | 1 |
| | | 4 | 1 |
| | | 5 | 2 |
| | 9 | 1 | 1 |
| | | 10 | 1 |
| | 11 | 2 | 3 |
| | | 3 | 2 |
| 4 | 1 | | |
| Gastrointestinal | 12 | 1 | 2 |
| | | 2 | 1 |
| | 13 | 2 | 1 |
| | | 3 | 2 |
| | 14 | 2 | 1 |
| | | 3 | 2 |
| | 15 | 2 | 1 |
| | | 3 | 2 |
| | 16 | 1 | 1 |
| | | 2 | 1 |
| | 17 | 3 | 2 |
| | | 4 | 3 |
| | 18 | 1 | 1 |
| | | 2 | 2 |
| | | 3 | 3 |
| 19 | 1 | 3 | |
| | 2 | 2 | |

| Domain | Item | Answer | Points |
|------------------|---------|--------|--------|
| Gastrointestinal | | 3 | 1 |
| | 20 | 1 | 1 |
| | 21 | 2 | 1 |
| | | 3 | 2 |
| | | 4 | 3 |
| | 22 | 1 | 1 |
| | | 2 | 2 |
| | | 3 | 3 |
| | 23 | 1 | 3 |
| | | 2 | 2 |
| | | 3 | 1 |
| | Bladder | 24 | 2 |
| | | 3 | 2 |
| | | 4 | 3 |
| 25 | | 2 | 1 |
| | | 3 | 2 |
| | | 4 | 3 |
| 26 | | 2 | 1 |
| | | 3 | 2 |
| | | 4 | 3 |
| Pupillomotor | 27 | 2 | 1 |
| | | 3 | 2 |
| | | 4 | 3 |
| | 28 | 1 | 1 |
| | | 2 | 2 |
| | | 3 | 3 |
| | 29 | 2 | 1 |
| | | 3 | 2 |
| | | 4 | 3 |
| | 30 | 1 | 1 |
| | | 2 | 2 |
| | | 3 | 3 |
| | 31 | 2 | 3 |
| | | 3 | 2 |
| | | 4 | 1 |

Final Domain Scoring

The final domain scores are generated by multiplying the raw score with a weight index. The total score is the sum of all domain scores.

Domains and Number of Questions Retained Based on Exploratory Factor Analysis and Clinical Revisions as Used in the Final Instrument (COMPASS 31)^a

Table 4: Final Domain Scoring

| Domain | No. of Questions | Max raw score | Weighting factor | Max weighted score | Cronbach (α) |
|-------------------------------|------------------|---------------|------------------|--------------------|-----------------------|
| Orthostatic Intolerance | 4 | 10 | 4.0 | 40 | 0.92 |
| Vasomotor | 3 | 6 | 0.8333333 | 5 | 0.91 |
| Secretomotor | 4 | 7 | 2.1428571 | 15 | 0.48 |
| Gastrointestinal ^b | 12 | 28 | 0.8928571 | 25 | 0.78 |
| Bladder | 3 | 9 | 1.1111111 | 10 | 0.62 |
| Pupillomotor | 5 | 15 | 0.3333333 | 5 | 0.84 |
| Total | 31 | 75 | 9.3134919 | 100 | 4.55 |

^a Appropriate weighting factors for each domain result in appropriately balanced autonomic domains and a total score between 0 and 100. Max = maximum.

^b Combines former constipation, diarrhea, and gastroparesis domains into one domain.

RESOURCES

Veteran Whole Health Library

<https://www.va.gov/WHOLEHEALTHLIBRARY/>

Veteran Whole Health Education Handouts

<https://www.va.gov/WHOLEHEALTH/veteran-handouts/index.asp>

Veterans Health Library

www.veteranshealthlibrary.va.gov

Veterans Crisis Line

<https://www.veteranscrisisline.net>

American Academy of Physical Medicine and Rehabilitation (AAPM&R)

<https://www.aapmr.org/members-publications/covid-19/pasc-guidance>

<https://www.aapmr.org/members-publications/icd-10-codes>

National Center for Health Promotion and Disease Prevention

www.prevention.va.gov

National Institute for Health and Care Excellence (NICE), UK

<https://www.nice.org.uk/guidance/ng188>

UW Integrative Health, Department of Family Medicine and Community Health

<https://www.fammed.wisc.edu/integrative/resources/>

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