Post COVID-19
A Long-COVID Primary Care Toolkit

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No Conflicts of Interest to Declare

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COVID-19

Post-Viral Syndrome
Post-infective and chronic fatigue syndromes precipitated by viral and non-viral pathogens: prospective cohort study

Ian Hickie, Tracey Davenport, Denis Wakefield, Ute Vollmer-Conna, Barbara Cameron, Suzanne D Vernon, William C Reeves, Andrew Lloyd, for the Dubbo Infection Outcomes Study Group

BMJ, doi:10.1136/bmj.38933.585764.AE (published 1 September 2006)

Design Prospective cohort study following patients from the time of acute infection with Epstein-Barr virus (glandular fever), Coxiella burnetii (Q fever), or Ross River virus (epidemic polyarthritis).

Results Prolonged illness characterised by disabling fatigue, musculoskeletal pain, neurocognitive difficulties, and mood disturbance was evident in 29 (12%) of 253 participants at six months, of whom 28 (11%) met the diagnostic criteria for chronic fatigue syndrome.

Conclusions A relatively uniform post-infective fatigue syndrome persists in a significant minority of patients for six months or more after clinical infection with several different viral and non-viral micro-organisms. Post-infective fatigue syndrome is a valid illness model for investigating one pathophysiological pathway to chronic fatigue syndrome.

- 11% ME/CFS at 6 mo.
- Consistent across infections
- Related to host response rather than pathogen
Abstract
As the current Zaire ebolavirus disease outbreak in West Africa fades, the health problems of the more than 16,500 survivors have come to light. A wide range of mental and physical symptoms may occur during the convalescence stage. Reported symptoms of "post-Ebolavirus disease syndrome" (PEVDS) include chronic joint and muscle pain, fatigue, anorexia, hearing loss, blurred vision, headache, sleep disturbances, low mood and short-term memory problems. PEVDS has been associated with a decrease in functionality and difficulties to return to work. Further studies are needed to fully categorize the clinical spectrum of PEVDS. Diagnostic criteria and surrogate markers for the early diagnosis of PEVDS, and implementation of specialized health services to treat and follow-up survivors are also needed.
No definitive evidence based recommendations exits
We therefore used a pragmatic
approach based in published papers
POST COVID-19
A LONG-COVID PRIMARY CARE TOOLKIT

OBJECTIVES
• Describe the symptoms of Long COVID
• Make a diagnosis of Long COVID
• Compare Long COVID to similar conditions
• Do a basic workup for Long COVID
• Identify co-morbid conditions associated with Long COVID
• Provide advice and resources for patients
• Locate physician resources

PRINCIPLES
• Focus on practical tools to help PCP care for patients
• Help manage patient expectations
• Avoid over-investigation and patient-driven testing
• Focus on patient self-management rather than diagnosis seeking
• Leverage multiple short-visits with specific tasks
• Uncouple patient visits from symptoms
• Leverage existing resources
Case

- 51 yo F - married with 2 kids - triathlete
- Previously well; No H/O CSS
- Presumed COVID Jan 2021
- Bed-bound for a week
- Persistent symptoms - unable to return to work
  - Breathlessness and difficulty taking in a deep breath; chest tightness
  - Fatigue, decreased activity tolerance, post-exertional malaise
  - Widespread aches and pains
  - Unrefreshing sleep; sleeps during the day
  - Brain Fog; mentally drained
  - Orthostatic intolerance
  - Loss of motivation and interest; not “coping”; overwhelmed
  - Feverish; tender lymph nodes; loss of smell
- No cardiac risk factors; no Fax CAD; very physically fit

**Late Complications of COVID-19; a Systematic Review of Current Evidence**

SA. SeyedAlinaghi et al.

Figure 2: Frequency of identified late complications of COVID-19.
What to call it?

- Post acute sequelae of COVID19 (PASC) – research term
- Long COVID
- Long-haul COVID
- Post-acute COVID syndrome
- Chronic COVID

(Myalgic encephalomyelitis/chronic fatigue syndrome?)

How to approach long-COVID patients

Complete review of systems, screening for common symptoms

Target investigations to patient symptoms

Exhaustive investigations are not required to rule out objective end-organ disease

Validate patient symptoms

Refer to subspecialty for red flags or objective findings of disease
Dr. Renée Janssen presentation

How to approach long-COVID patients

- Complete review of systems, screening for common symptoms
- Target investigations to patient symptoms
- Exhaustive investigations are not required to rule out objective end-organ disease
- Validate patient symptoms
- Refer to subspecialty for red flags or objective findings of disease

Central Sensitization Phenotypes in Post Acute Sequelae of SARS-CoV-2 Infection (PASC): Defining the Post COVID Syndrome

Dates received: 24 May 2021; revised: 17 June 2021; accepted: 18 June 2021.

- Mayo Clinic Rochester
- Post acute sequelae of SARS-CoV-2 infection (PASC)
  - Heterogeneous group
- 3 Groups
  - Tissue damage
    - e.g., lung scarring, myocarditis, anosmia
  - No identifiable tissue damage *
    - Post-viral syndrome
    - CSS (Mayo Clinic)
    - Psychiatric / psychological

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    • Post-viral syndrome
    • CSS (Mayo Clinic)
  • Psychiatric / psychological

* Messaging
  NOT psychosomatic or somatiform
Medical Gaslighting

"How do I know you're not malingering?"

News & Analysis

Medical News & Perspectives

As Their Numbers Grow, COVID-19 “Long Haulers” Stump Experts

Rita Rubin, MA

• Medical Gaslighting
  • “Many long haulers never had laboratory confirmation of COVID-19, which, they say, adds to some health care professionals' skepticism that their persistent symptoms have a physiological basis.”
  • “these mystery diagnoses are real, and they’re not just in patients' heads.”
  • Post-viral syndrome

• Solve ME/CFS Initiative
  • Registry and biobank: COVID-19 long haulers | ME/CFS | healthy controls
Central Sensitization Phenotypes in Post Acute Sequelae of SARS-CoV-2 Infection (PASC): Defining the Post COVID Syndrome

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- Post COVID syndrome (Long COVID)
  - Post-viral syndrome
  - Clinical stabilization or resolution of viral infection
  - > 3 weeks
  - + COVID test NOT required: not tested; false +
  - Some…
    - Go on to meet criteria for ME/CFS, FM, POTS, other CSS
  - Note: excluded patients with pre-existing CSS !!
Central Sensitization Phenotypes in Post Acute Sequelae of SARS-CoV-2 Infection (PASC): Defining the Post COVID Syndrome

Dates received: 24 May 2021; revised: 17 June 2021; accepted: 18 June 2021.

- Post COVID Syndrome (Long COVID): 42/465 (9%)
- \( \frac{1}{3} \) male - \( \frac{2}{3} \) female (2:1 female)
- Age 21 - 74 (average 46)
- Most common symptoms
  - Pain (90%)
  - Fatigue (74%) - ?? PEM
  - Dyspnea (43%)
  - Orthostatic intolerance (38%)

Review

Long COVID and Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS)—A Systemic Review and Comparison of Clinical Presentation and Symptomatology

Timothy L. Wong * and Danielle J. Weitzer

• “high degree of similarities between long COVID and ME/CFS”
• 25/29 ME/CFS symptoms were reported by at least one long COVID study
• NOT Reported: 1. motor disturbance; 2. tinnitus/double vision; 3. lymph node pain/tenderness; 4. sensitivity to chemicals, foods, medications, odours
• Estimated 10% with COVID-19 may develop ME/CFS
• It may be too early to establish a direct causal relationship between long COVID and the development of ME/CFS
Humility and Acceptance: Working Within Our Limits With Long COVID and Myalgic Encephalomyelitis/Chronic Fatigue Syndrome

SIMON DÉCARY, PT, PhD • ISABELLE GABOURY, PhD • SABRINA POIRIER • CHRISTIANE GARCIA • SCOTT SIMPSON, BA, CWC • MICHELLE BULL, PhD • DARREN BROWN, MSc, MRes • FRÉDÉRIQUE DAIGLE, MSc

Deconditioned?

Early efforts drove rehabilitation teams to apply exercise-based protocols.

The history of ME/CFS with exercise is one of false hope.

Post-exertional malaise and worsening of symptoms!

STOP trying to push your limits. Overexertion may be detrimental to your recovery.

REST is your most important management strategy. Do not wait until you feel symptoms to rest.

PACE your daily physical and cognitive activities. This is a safe approach to navigate triggers of symptoms.

FIGURE. The “Stop. Rest. Pace” approach to safely manage physical and cognitive activities while recovering from long COVID.
STOP trying to push your limits. Overexertion may be detrimental to your recovery.

REST is your most important management strategy. Do not wait until you feel symptoms to rest.

PACE your daily physical and cognitive activities. This is a safe approach to navigate triggers of symptoms.

FIGURE. The “Stop. Rest. Pace” approach to safely manage physical and cognitive activities while recovering from long COVID.

Messaging

PEM is a game-changer!

Pushing through symptoms
Or
Boom/Bust

Makes things worse
Prolongs recovery
Reduces chances of remission

Some patients may benefit from Exercise

Diagnosis and Treatment of Chronic Fatigue Syndrome

it’s mitochondria, not hypochondria
POST-EXERTIONAL MALAISE

VO2 MAX

Power vs Oxygen Consumption

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Discriminative Validity of Metabolic and Workload Measurements for Identifying People With Chronic Fatigue Syndrome

Christopher R. Snell, Staci R. Stevens, Todd E. Davenport, J. Mark Van Ness

Figure 2
Measurements of workload at peak exercise (A) and at the ventilatory threshold (B) in participants with chronic fatigue syndrome (CFS) and control participants during cardiopulmonary exercise test 1 (blue bars) and cardiopulmonary exercise test 2 (gold bars). Error bars represent 1 standard deviation.
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PAIN PATHWAY

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Chronic Pain – A New Type

- Pain falls into three categories:
  - Nociceptive – inflammation and damage
  - Neuropathic – damaged or irritated nerves
  - Nociplastic
    - Volume knob for pain is turned up
    - “Central sensitization”
    - e.g., FM
  - “Noci-” is from the Latin for “to do harm”
- A person might have more than one type of pain

Chronic Pain

Sensitization & Amplification
CHRONIC PAIN: SENSITIVITY SHIFT

Stimulus Intensity

Pain Sensation

Innocuous

Noxious

Hyperalgesia

Injury

Normal

Allodynia

Innocuous

Noxious

Stimulus Intensity

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Functional Magnetic Resonance Imaging Evidence of Augmented Pain Processing in Fibromyalgia

Richard H. Gracely,1 Frank Petzke,2 Julie M. Wolf,3 and Daniel J. Clauw2

Results.

Stimulation with adequate pressure to cause comparable subjectively reported levels of pain resulted in increased fMRI signal in 19 regions common to both groups, and decreased signal was observed in 1 region of increased regional cerebral blood flow in healthy controls and 12 significant regions in patients. In aggregate, psychophysical studies demonstrate that increased sensitivity to pressure in this condition extends to brain regions that process pain. The fact that comparable subjectively reported levels of pain were associated with different patterns of brain activation supports the hypothesis that altered central pain processing is a factor in the presentation of this disease. The use of functional brain imaging techniques provides an opportunity to examine central pain processing in patients with FM.

Conclusion.

Augmented pain processing is a factor in the presentation of fibromyalgia (FM). The use of functional brain imaging techniques provides an opportunity to examine central pain processing in patients with FM.
Functional Magnetic Resonance Imaging Evidence of Augmented Pain Processing in Fibromyalgia

Richard H. Gracely,1 Frank Petzke,2 Julie M. Wolf,3 and Daniel J. Clauw2

Objective. To use functional magnetic resonance imaging (fMRI) to evaluate the pattern of cerebral activation during the application of painful pressure to the left thumb-nail beds of 16 right-handed patients with fibromyalgia (FM) compared with controls, who were tested under 2 conditions: the "stimulus pressure control" condition, during which they received an amount of pressure similar to that delivered to patients, and the "subjective pain control" condition, during which the patients underwent fMRI while moderately painful pressure was being applied. The functional activation patterns in FM patients were compared with those in controls, who were tested under similar conditions.

The etiology of FM remains elusive, although there is evidence that FM is characterized by cortical or subcortical augmentation of pain processing.

Population-based studies have demonstrated that FM prevalence in at least 5 industrialized countries (2,3). The fact that comparable subjectively unpleasant or noxious (pain threshold) is lower with the same amount of pressure that causes pain in FM patients with FM and control subjects generally provides an opportunity to examine central pain processing in patients with FM.

Conclusion. The development of functional brain imaging techniques provides an opportunity to examine central pain processing in FM. The etiology of FM remains elusive, although there is evidence that FM is characterized by cortical or subcortical augmentation of pain processing.
Central Sensitivity Syndromes

ME/CFS (Myalgic Encephalomyelitis/Chronic Fatigue Syndrome); FM (Fibromyalgia); MCS (Multiple Chemical Sensitivities); CLD (Chronic Lyme Disease); IBS (Irritable Bowel Syndrome); T-T (Tension Type); TMD (Temporomandibular Disorders); POTS (Postural Orthostatic Tachycardia Syndrome); RLS (Restless Leg Syndrome); Others including: irritable larynx syndrome, PTSD (Post Traumatic Stress Syndrome, non-cardiac chest pain (costochondritis), myofascial pain syndrome, and other pain syndromes.

Adapted from Yunus, Semin Arthritis Rheum 36:339-356

Birds of a Feather
Central Sensitivity Syndromes

- ME/CFS
- Fibromyalgia
- Myofascial Pain Syndrome
- Migraines
- Tension Type Headaches
- Irritable Bowel Syndrome
- Interstitial Cystitis
- Pelvic Pain Syndrome
- PTSD
- Non-Cardiac Chest Pain (Costochondritis)
- Temporomandibular Disorder
- Irritable Larynx Syndrome
- Central Abdominal Pains Syndrome (AKA Functional)
- Other Pain Syndromes
POTS: POSTURAL ORTHOSTATIC TACHYCARDIA SYNDROME

- Associated symptoms
  - Fatigue
  - Sleep disturbance
  - Cognitive symptoms
  - GI symptoms
  - Headaches
  - Other autonomic phenomena

- POTS Dx criteria
  - 1st thing in the AM
  - HR before getting out of bed
  - HR upon standing: time 0, 1, 3, 5, 10 min
  - HR > 120 or ↑ 30 BPM

ME/CFS:
2003 Canadian Clinical Working Case Definition
- Pathological Fatigue
  - A significant degree of new onset, unexplained, persistent or recurrent physical and/or mental fatigue that substantially reduces activity levels and which is not the result of ongoing exertion and is not relieved by rest
- Post-exertional Malaise and Worsening of Symptoms
  - Mild exertion or even normal activity is followed by malaise: the loss of physical and mental stamina and/or worsening of other symptoms. Recovery is delayed, taking more than 24 hours
- Sleep Dysfunction
  - Sleep is un-refreshing: disturbed quantity - daytime hypersomnia or nighttime insomnia and/or disturbed rhythm - day/night reversal. Rarely, there is no sleep problem.
- Pain
  - Pain is widespread, migratory or localized: myalgia; arthralgia (without signs of inflammation); and/or headache - a new type, pattern or severity. Rarely, there is no pain
- Neurocognitive Manifestations (2 or more)
  - confusion
  - short-term memory
  - categorizing and word retrieval
  - perceptual and sensory disturbances
  - ataxia
  - fascination
  - emotional overload
  - cognitive overload
  - hypersensitivity to light or sound
- At least one symptom from three of the following categories:
  - Autonomic Manifestations
    - orthostatic intolerance–neurally mediated hypotension (NMH)
    - postural orthostatic tachycardia syndrome (POTS)
    - delayed postural hypotension
    - extreme pallor
    - urinary frequency and bladder dysfunction
    - palpitations with or without cardiac arrhythmias
    - exertional dyspnea
  - Neuroendocrine Manifestations
    - loss of thermostatic stability–subnormal body temp; marked diurnal fluctuation
    - sweating episodes
    - cold extremities
    - marked weight change
    - loss of adaptability and worsening of symptoms with stress
  - Immune Manifestations
    - Tender lymph nodes
    - recurrent flu-like symptoms
    - new sensitivities to food, medications and/or chemicals
    - The illness has persisted for at least 6 months

SEID:
2015 Institute of Medicine Diagnostic Criteria
- Diagnosis requires the following three symptoms:
  - A substantial reduction or impairment in the ability to engage in pre-illness levels of occupational, educational, social, or personal activities, that persists for more than 6 months and is accompanied by Fatigue, which is often profound, is of new or definite onset (not lifelong), is not the result of ongoing excessive exertion, and is not substantially alleviated by rest,
  - Post-exertional Malaise* and
  - Unrefreshing Sleep*
- At least one of the two following:
  - Cognitive Impairment*
    - Frequency and severity of symptoms should be assessed. The diagnosis of ME/CFS/SEID should be questioned if patients do not have these symptoms at least half of the time with moderate, substantial, or severe intensity.
  - Orthostatic Intolerance*
Sleep is un-refreshing: disturbed quantity - daytime hypersomnia or

Pain is widespread, migratory or localized: myalgia; arthralgia (without

A significant degree of new onset, unexplained, persistent or recurrent

and which is not the result of ongoing exertion and is not relieved by rest

Persistently disturbed sleep: taking more than 24 hours

Sleep Dysfunction

Sleep is un-refreshing: disturbed quantity - daytime hypersomnia or nighttime insomnia and/or disturbed rhythm - daylight reversal. Rarely, there is no sleep problem.

Pain

Pain is widespread, migratory or localized: myalgia; arthralgia (without

Neurocognitive Manifestations (2 or more)

Confusion

Disorientation
categorizing and word retrieval
Stupor

Sleep disturbance

Fatigue

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Long-COVID Primary Care Toolkit

- Overview
- Dysautonomia & POTS
- Mental Health
- Pain
- Central Sensitivity Syndromes
- Approach to Common Symptoms
- New or Changing Symptoms
- Work/Disability/Paperwork
- Principles of CBT
**PRINCIPLES — YOU GOT THIS**

- Patient centred
- Trauma-informed care
  - www.cdc.gov/cpr/infographics/6_principles_trauma_info.htm
- Shared decision making
- Optimization of quality of life and function
- Self-management strategies
- Symptom focused
  - Red flags & risk factors
- Patient education
- Transparency - incomplete/changing knowledge
- Standardized care
- Uncoupling of symptoms with medical visits

**PHYSICAL SYMPTOMS**

- Fatigue
- Pain
- Brain Fog
- Sleep Problems
- Unexplained Symptoms
  - Resp
  - Autonomic
  - CNS
  - GI
Long COVID Symptom Inventory

<table>
<thead>
<tr>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of COVID onset:</td>
</tr>
<tr>
<td>Positive COVID test: Yes ☐ No ☐</td>
</tr>
</tbody>
</table>

Please circle all symptoms that apply.

<table>
<thead>
<tr>
<th>Fatigue</th>
<th>Physical fatigue</th>
<th>Mental fatigue</th>
<th>Decreased activity tolerance</th>
<th>Decreased exercise capacity</th>
<th>Post-exertional malaise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>Muscle pain</td>
<td>Headaches</td>
<td>Chest pain</td>
<td>Chest tightness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abdominal pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>Unrefreshing sleep</td>
<td>Difficulty falling asleep</td>
<td>Difficulty staying asleep</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain fog</td>
<td>Poor memory</td>
<td>Difficulty concentrating</td>
<td>Difficulty finding words</td>
<td>Easily overwhelmed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unexplained Symptoms</th>
<th>Lung</th>
<th>Shortness of breath</th>
<th>Difficulty taking a deep breath</th>
<th>Cough</th>
<th>Wheezing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomic</td>
<td></td>
<td>Lightheadedness</td>
<td>Dizziness</td>
<td>Fainting</td>
<td>Low blood pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Palpitations</td>
<td>Racing heart</td>
<td>Irregular heart</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feverish</td>
<td>Night sweats</td>
<td>Heat/cold intolerance</td>
<td></td>
</tr>
<tr>
<td>Digestive</td>
<td></td>
<td>Loss of appetite</td>
<td>Nausea</td>
<td>Vomiting</td>
<td>Significant weight change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diarrhea</td>
<td>Constipation</td>
<td>Abdominal bloating</td>
<td>Abdominal cramps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Abdominal pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nervous system</td>
<td></td>
<td>Loss of taste or smell</td>
<td>Blurry vision</td>
<td>Vertigo</td>
<td>Problems with balance and coordination</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numbness and tingling</td>
<td>Muscle weakness</td>
<td>Hypersensitivity to light or sound</td>
<td></td>
</tr>
<tr>
<td>Immune</td>
<td></td>
<td>Sore throat</td>
<td>Tender lymph nodes</td>
<td>Recurrent flu-like symptoms</td>
<td>Sensitivities to food/medications/chemicals</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>Hair loss</td>
<td>Rash</td>
<td>Menstrual cycle irregularities</td>
<td>Urinary frequency</td>
</tr>
<tr>
<td>Psychiatric</td>
<td></td>
<td>Depression</td>
<td>Anxiety</td>
<td>Mood swings</td>
<td>PTSD</td>
</tr>
</tbody>
</table>

Do you have any of the following pre-existing Central Sensitivity Syndromes?

☐ None

☐ Chronic Fatigue Syndrome (ME/CFS)
☐ Fibromyalgia
☐ Headaches (tension type)
☐ IBS (irritable bowel syndrome)
☐ Interstitial Cystitis
☐ Irritable larynx syndrome
☐ Migraines
☐ Myofascial pain syndrome
☐ Non-cardiac chest pain
☐ Pelvic pain syndrome & related disorders
☐ POTS (postural orthostatic tachycardia syndrome)
☐ PTSD (post-traumatic stress disorder)
☐ Restless leg syndrome
☐ Temporomandibular disorders (TMD/TMJ)
☐ Multiple chemical sensitivities/environmental sensitivities
☐ Other:
## Long COVID Symptom Inventory

### Case

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date of COVID onset:</th>
<th>Positive COVID test:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jan 2021</td>
<td>Yes ☐ No ☐</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Please circle all symptoms that apply.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fatigue</strong></td>
</tr>
<tr>
<td>Physical fatigue</td>
</tr>
<tr>
<td>Mental fatigue</td>
</tr>
<tr>
<td>Decreased activity tolerance</td>
</tr>
<tr>
<td>Decreased exercise capacity</td>
</tr>
<tr>
<td>Post-exertional malaise</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
</tr>
<tr>
<td>Muscle pain</td>
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<tr>
<td>Joint pain</td>
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<tr>
<td>Headaches</td>
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<tr>
<td>Chest pain</td>
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<tr>
<td>Chest tightness</td>
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<tr>
<td>Fatigue</td>
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<tr>
<td>Physical fatigue</td>
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<tr>
<td>Mental fatigue</td>
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<tr>
<td>Decreased activity tolerance</td>
</tr>
<tr>
<td>Decreased exercise capacity</td>
</tr>
<tr>
<td>Post-exertional malaise</td>
</tr>
<tr>
<td><strong>Sleep disturbance</strong></td>
</tr>
<tr>
<td>Sleep disturbances</td>
</tr>
<tr>
<td>Difficulty taking a deep breath</td>
</tr>
<tr>
<td>Difficulty staying asleep</td>
</tr>
<tr>
<td><strong>Brain fog</strong></td>
</tr>
<tr>
<td>Poor memory</td>
</tr>
<tr>
<td>Difficulty concentrating</td>
</tr>
<tr>
<td>Difficulty finding words</td>
</tr>
<tr>
<td>Easily overwhelmed</td>
</tr>
<tr>
<td><strong>Unexplained Symptoms</strong></td>
</tr>
<tr>
<td>Lung</td>
</tr>
<tr>
<td>Shortness of breath</td>
</tr>
<tr>
<td>Difficulty taking a deep breath</td>
</tr>
<tr>
<td>Cough</td>
</tr>
<tr>
<td>Wheezing</td>
</tr>
<tr>
<td>Autonomic</td>
</tr>
<tr>
<td>Lightheadedness</td>
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<tr>
<td>Dizziness</td>
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<tr>
<td>Fainting</td>
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<tr>
<td>Low blood pressure</td>
</tr>
<tr>
<td>Digestive</td>
</tr>
<tr>
<td>Loss of appetite</td>
</tr>
<tr>
<td>Nausea</td>
</tr>
<tr>
<td>Vomiting</td>
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<tr>
<td>Significant weight change</td>
</tr>
<tr>
<td>Diarrhea</td>
</tr>
<tr>
<td>Constipation</td>
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<tr>
<td>Abdominal bloating</td>
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<tr>
<td>Abdominal cramps</td>
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<tr>
<td>Nervous system</td>
</tr>
<tr>
<td>Loss of taste or smell</td>
</tr>
<tr>
<td>Blurred vision</td>
</tr>
<tr>
<td>Muscle weakness</td>
</tr>
<tr>
<td>Hypersensitivity to light or sound</td>
</tr>
<tr>
<td>Problems with balance and coordination</td>
</tr>
<tr>
<td>Immune</td>
</tr>
<tr>
<td>Sore throat</td>
</tr>
<tr>
<td>Fever lumps</td>
</tr>
<tr>
<td>Recurrent flu-like symptoms</td>
</tr>
<tr>
<td>Sensitivities to food/medications/chemicals</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Hair loss</td>
</tr>
<tr>
<td>Rash</td>
</tr>
<tr>
<td>Menstrual cycle irregularities</td>
</tr>
<tr>
<td>Urinary frequency</td>
</tr>
<tr>
<td>Psychiatric</td>
</tr>
<tr>
<td>Depression</td>
</tr>
<tr>
<td>Anxiety</td>
</tr>
<tr>
<td>Mood swings</td>
</tr>
<tr>
<td>PTSD</td>
</tr>
</tbody>
</table>
Long COVID Symptom Inventory

Do you have any of the following pre-existing Central Sensitivity Syndromes?

☐ None

☐ Chronic Fatigue Syndrome (ME/CFS)
☐ Fibromyalgia
☐ Headaches (tension type)
☐ IBS (irritable bowel syndrome)
☐ Interstitial Cystitis
☐ Irritable larynx syndrome
☐ Migraines
☐ Myofascial pain syndrome
☐ Non-cardiac chest pain
☐ Pelvic pain syndrome & related disorders
☐ POTS (postural orthostatic tachycardia syndrome
☐ PTSD (post-traumatic stress disorder)
☐ Restless leg syndrome
☐ Temporomandibular disorders (TMD/TMJ)
☐ Multiple chemical sensitivities/environmental sensitivities
☐ Other:

BASIC WORKUP FOR LONG-COVID

• Long-COVID does NOT require an exhaustive workup
• EBM recommendations do not exist
• Appropriate but limited workup
• Using the pre-printed Symptoms Inventory helpful
  • DDx and coexisting conditions needing workup
• Initial evaluation should include:
  • Identification of Red Flags and Risk Factors requiring further evaluation
  • Limited medical work-up
Basic Workup for Long-COVID

• Long COVID does NOT require an exhaustive workup
• Appropriate but limited workup
• Using the pre-printed Symptoms Inventory helpful
  • DDx and coexisting conditions needing workup
• Initial evaluation should include:
  • Identification of Red Flags and Risk Factors requiring further evaluation
  • Limited medical work-up

**Messaging**

Long COVID is NOT diagnosis of exclusion

**Case**

Breathlessness and difficulty taking in a deep breath; chest tightness
No cardiac risk factors; no FHx CAD; very physically fit
BASIC WORKUP FOR LONG-COVID

Basic Workup for Long COVID
• Long COVID is NOT diagnoses of exclusion and do NOT require an exhaustive workup
• Patients require an appropriate but limited workup
• Using the pre-printed Symptom Inventory helpful
• Initial evaluation should include:
  - Limited medical workup
  - +/- Rapid exercise tests for exertional desaturation in covid-19
    - Baseline pulse oximeter should be > 95%
    - One minute doing sit-to-stand as fast as they can (supervised)
    - A 3% drop ofSpo2 requires further work-up
  - +/- Age-appropriate malignancy screening
  - +/- OSA screen (e.g., STOP BANG questionnaire)
• The initial evaluation provides a differential diagnosis and identifies possible co-existing conditions

Screening Bloodwork:
• CBC + diff
• Lym, eos, creatinine
• Mg, Phos, Ca
• Fasting blood sugar
• BNP
• Liver tests: ASAT, ALT, AST, ALP, bilirubin, albumin
• CK
• TSH
• Ferritin (< 50 associated with fatigue even in the absence of anemia)
• Erythrocytes
• HIV
• HCV
• HBV
• +/- CXR
• +/- HIV test (age-appropriate screening)
• +/- anti-TT (if symptoms)

Note: ANA is not recommended as a screening test

What is the efficacy and safety of rapid exercise tests for exertional desaturation in covid-19?

What is the efficacy and safety of rapid exercise tests for exertional desaturation in covid-19?
A 3% drop in pulse oximeter reading on exercise is cause for concern in covid-19. The 1-minute sit-to-stand test (patient goes sit to stand as many times as they can) has been validated; the unvalidated 40-step test (take 40 steps on a flat surface) is in widespread use. Neither should be attempted outside a supervised care setting if oximeter reading is < 96%.

#EvidenceCOVID
Trisha Greenhalgh, Babak Javid, Matthew Knight, Matt Inada-Kim 21st April 2020
What is the efficacy and safety of rapid exercise tests for exertional desaturation in covid-19?


- Home pulse oximetry can be helpful in monitoring breathlessness
- Useful in the assessment and reassurance of patients

A 3% drop in pulse oximeter reading on exercise is cause for concern in covid-19. The 1-minute sit-to-stand test (patient goes from sit to stand as many times as they can) has been validated; the unvalidated 40-step test (take 40 steps on a flat surface) is in widespread use. Neither should be attempted outside a supervised care setting if oximeter reading is < 96%.

#EvidenceCOVID

Trisha Greenhalgh, Babak Javid, Matthew Knight, Matt Inada-Kim 21st April 2020

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**Long COVID Worksheet**

Name:

### Pre-existing Central Sensitivity Syndromes
- None
- Chronic Fatigue Syndrome (ME/CFS)
- Fibromyalgia
- Migraines
- Myofascial pain syndrome
- Non-cardiac chest pain
- Pelvis pain syndrome & related disorders
- POTS (postural orthostatic tachycardia syndrome)
- Post-traumatic stress disorder
- Temporomandibular disorders (TMD/TMJ)
- Multiple chemical sensitivities/environmental sensitivities
- Other

### Co-morbid psychiatric problems
- Depression
- Anxiety
- Other

### Differential diagnosis and co-existing conditions that need to be worked up
- Dyspnea
- Chest pain
- Neurological symptoms
- DKA
- POTS
- Other

### Investigations ordered
- Routine Long COVID bloodwork
- CXR
- EKG
- Persantine MIBI (avoid exercise stress test)
- Holter
- Overnight oximetry
- Age appropriate malignancy screening
- MRI
- Menopause
- PAG
- PSA
- Other

### Referrals
- Post COVID Clinic
- Respiratory
- Gastroenterology
- Neurology
- Other

### Patient Handouts
- Long COVID Patient Resources
- POTS home test
- PSA
- Other

### Plan for next visit
- Review investigations
- Rapid exercise tests for exertional desaturation
- Review POTS home test
- Other

### Notes
Long COVID Worksheet

Name:

- Long COVID
- With features of ME/CFS
- With features of FM
- With features of orthostatic intolerance
- With loss of taste or smell
- Other

Pre-existing Central Sensitivity Syndromes
- None
- Chronic Fatigue Syndrome (ME/CFS)
- Fibromyalgia
- Headaches (tension type)
- IBS (irritable bowel syndrome)
- Inflammatory bowel disease
- Migraines
- Myalgic encephalitis/myalgic encephalomyelitis
- Non-cardiac chest pain
- Pelvic pain syndrome & related disorders
- Postural orthostatic tachycardia syndrome (POTS)
- Post-traumatic stress disorder (PTSD)
- Restless leg syndrome
- Tension-type headaches
- Temporomandibular disorders (TMD/TMJ)
- Multiple chemical sensitivities/environmental sensitivities
- Other

Co-morbid psychiatric problems
- Depression
- Anxiety
- PTSD
- Other

Differential diagnosis and co-existing conditions that need to be worked up
- Dyspnea
- Chest pain
- Neurological symptoms
- OSA
- Other

Investigations ordered
- Age appropriate malignancy screening
- Bloodwork
- CXR
- EKG
- Holter
- Overnight oximetry
- Persantine MIBI
- PSA
- Pap
- FIT
- Mammogram
- Other

Referrals
- Post COVID Clinic
- Respiratory
- Cardiology
- Neurology
- Other

Patient Handouts
- Long COVID Patient Resources
- POTS home test
- Other

Plan for next visit
- Review investigations
- Rapid exercise tests for exertional desaturation
- Review POTS home test
- Other

Notes
POTS (Postural Orthostatic Tachycardia Syndrome – Home Test

What is POTS?
POTS is a medical condition where the heart races when a person stands up. It is part of the family of conditions called dysautonomias – problems with the autonomic (i.e., automatic) nervous system. In addition to a racing heart, symptoms include lightheadedness, dizziness, and fainting.

How do you test for POTS?
You can easily test for POTS at home. The home test is as good, if not better, that specialized testing like tilt-table testing.

1. First thing in the morning, before getting out of bed, take your heart rate: _______
2. Take your heart rate immediately upon standing: _______
3. Repeat your heart rate after:
   1 minute _______
   3 minutes _______
   5 minutes _______
   10 minutes _______

Note: Lie down immediate if you feel like you’re going to faint.
Bring the results to your next visit with your family doctor.

You may have POTS if your heart rate spikes to more than 120 beats per minute or increases by more than 30 beats per minute at any time during the 10 minutes. You can stop the test.

Where Can I learn more about POTS?
POTS - Perspectives for Patients
Review From a Medical Journal
Salt for POTS
Exercise for POTS
Dysautonomia International: POTS
Lifestyle Adaptations for POTS
Medical Journal Articles on POTS

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PROGNOSIS - RULES OF THUMB

• Anecdotally - most patients get better

• Poorer prognosis
  • ? Pre-existing CSS – more = worse
  • ? More severe & greater number of symptoms
  • ? Longer duration of symptoms
  • ? Psychiatric comorbidities

• Transparency
  • We don’t really know
  • More will be revealed…
PROGNOSIS - RULES OF THUMB

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  • We don’t really know
  • More will be revealed…

Messaging

Most patients recover spontaneously (if slowly) with holistic support, rest, symptomatic treatment, and gradual increase in activity.

www.phsa.ca/health-professionals/clinical-resources/post-covid-19-care

Post-COVID-19 Care

Support patients who were infected with COVID-19 and who experience lingering symptoms to manage their condition over time.

Post-COVID-19 recovery clinics are designed to see patients at or following 12 weeks post-symptom onset and are not meant to address acute concerns.

Support for health professionals

Physicians and nurse practitioners can request advice on post-COVID-19 care from an internal medicine specialist through:

• Rapid Access to Specialist Consultation (RACE) app, for urgent questions that require a call back within 2 hours. RACE is staffed Monday to Friday, 8am to 5pm. The specialist is listed as RACEP – GM.
LONG-COVID PRIMARY CARE TOOLKIT

• Overview
• Dysautonomia & POTS
• Mental Health
• Pain
• Central Sensitivity Syndromes
• Approach to Common Symptoms
• New or Changing Symptoms
• Work/Disability/Paperwork
• Principles of CBT

QUESTIONS...

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