

“Post-Acute Covid Syndrome”

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No financial or other conflicts of interest

What we'll discuss

Resources & Acknowledgements

Background

Data

The heart

Patient advocacy

Concluding comments

- *FREE* COVID-19: An ACP Physicians Guide www.acponline.org
- <https://www.cdc.gov/coronavirus/2019-ncov/hcp/index.html>
- For clinicians: 800-CDC-INFO (800-232-4636)

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// We are change agents and leaders. We bridge gaps in not only patient care but also academia and administration.— Stefanie Brown, MD, FACP, FAAP

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ACP News VIEW ALL

Internists call for increased competition in prescription drug market to help mitigate rising costs 09/14/20

Internists urge Congress to support planned increases in

Society for Healthcare Epidemiology of America

<https://www.shea-online.org>

The screenshot shows the SHEA website homepage. At the top, there is a navigation bar with the slogan "SAFE HEALTHCARE FOR ALL" and links for "ABOUT", "MEMBERSHIP", "CONTACT US", and "LOGIN". Below this is the SHEA logo and a secondary navigation bar with links for "EDUCATION", "PRACTICE RESOURCES", "NEWS", "POLICY", and "FOUNDATION". The main banner features a large image of red coronavirus particles with the text "Novel Coronavirus 2019 (COVID-19) Resources". Below the banner is the mission statement: "SHEA's mission is to promote the prevention of healthcare-associated infections and antibiotic resistance." The "NEWS AT SHEA" section contains three articles: "Healthcare Epidemiologists Endorse Requiring Recommended Vaccinations for Healthcare Personnel, Educators and Students", "Antimicrobial Stewardship & Healthcare Epidemiology (ASHE) Editor-in-Chief", and "Guidance Balances Staph Infection Prevention in Critically Ill Infants with Family Contact". To the right is a box for the "SHEA EDUCATION & RESEARCH FOUNDATION" with a brief description.

David Jay Weber, M.D., M.P.H.

<https://www.idsociety.org>

Infectious Disease Society of America

The screenshot shows the homepage of the COVID-19 Real-Time Learning Network. On the left is a navigation menu with categories such as Clinical Guidelines & Guidance, Therapeutics & Interventions, Diagnostics, Infection Prevention, Disease Manifestations & Complications, Special Populations, Literature & Research, Vaccines & Immunity, Policy & Advocacy, Disabilities & Culturally Competent Care, and Resources & Support for Clinicians. The main content area features a large blue banner with the title "COVID-19 Real-Time Learning Network" and a "READ MORE" button. Below the banner is a section titled "The Latest: What You Need to Know Today" containing two article cards: "Focus on Flu" and "Federal Coverage for COVID-19 Vaccines & Treatment".

COVID-19 Real-Time Learning Network

Stay up to date on COVID-19 disease manifestations and complications.

[READ MORE](#)

The Latest: What You Need to Know Today

Focus on Flu
Resources for the 2020-21 influenza season in light of the pandemic.
[VIEW WEBSITE](#)

Federal Coverage for COVID-19 Vaccines & Treatment
Interim final CMS rule proposes new vaccine coverage and treatment reimbursement policies.
[VIEW WEBSITE](#) 28 Oct

Background

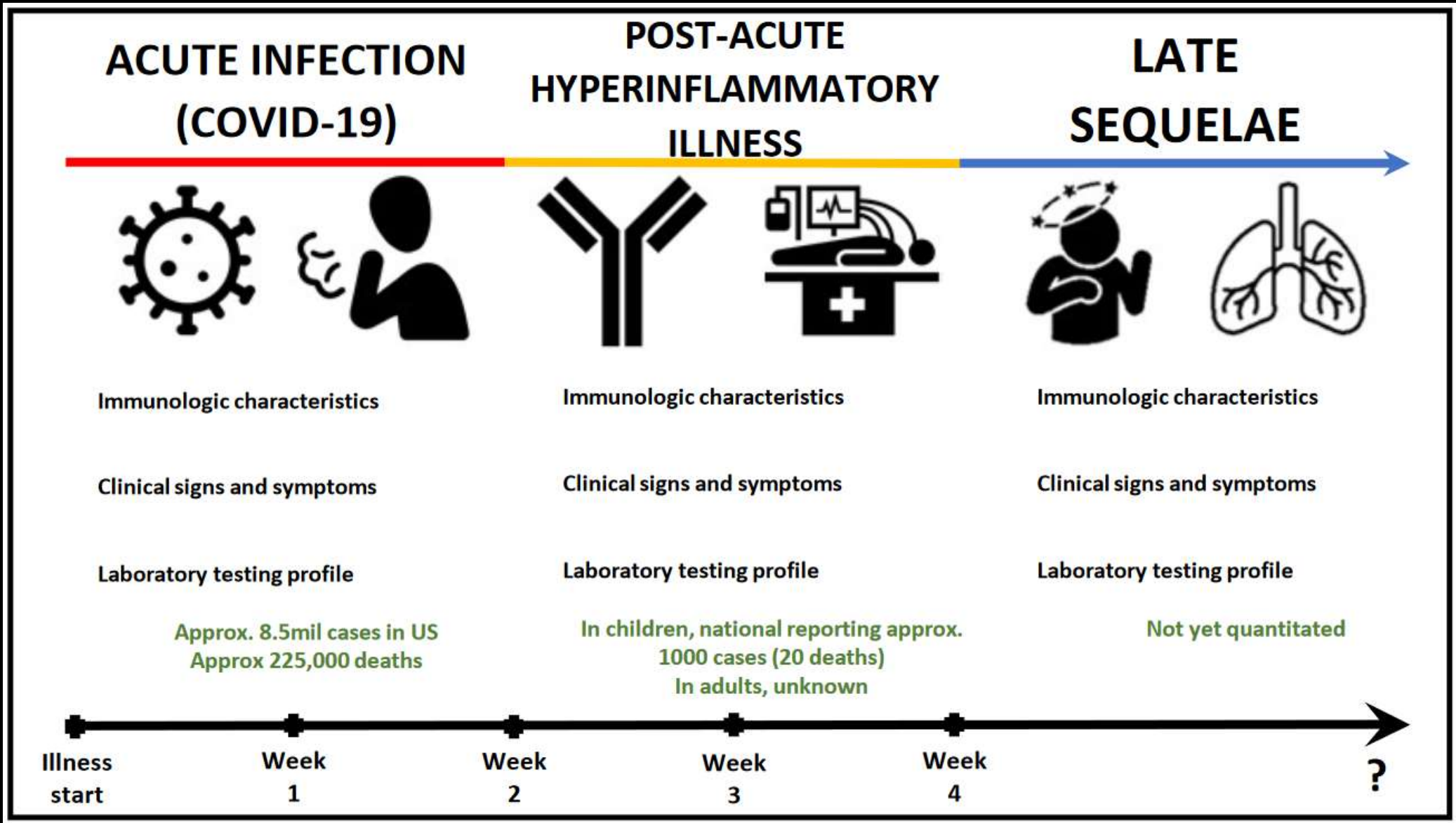
Humility

We are still learning

What we think is true today may not be true tomorrow...

Impressively wide clinical spectrum

- Asymptomatic—
understanding still evolving
- Mild-Moderate—
 - Mild: fever, cough, muscle pain, nasal congestion, sore throat
 - Moderate: cough plus moderate dyspnea consistent with moderate pneumonia
- Severe acute disease—
severe pneumonia with severe dyspnea, hypoxia
- Critical—respiratory failure, septic shock, organ failure
- Recovery: *we are still learning...*
- Persons of *all ages* are at risk for infection and severe disease
- Fatal disease risk greatest in those > 65 years, living in a nursing home or long-term care facility, or underlying conditions: obesity, HTN, diabetes, cardiovascular disease, renal disease, chronic respiratory disease, renal disease
- Pediatric multisystem inflammatory syndrome—
persistent fevers and features of Kawasaki disease and/or toxic shock syndrome



S. Deblina Datta, MD, FIDSA, Clinical Team Lead CDC COVID 19 Response, 23 October 2020



Long-hauler



19 August 2020 | Ed Yong

Long-Haulers Are Redefining COVID-19

Without understanding the lingering illness that some patients experience, we can't understand the pandemic



<https://www.theatlantic.com/health/archive/2020/08/long-haulers-covid-19-recognition-support-groups-symptoms/615382/>

VIEWPOINT

Carlos del Rio, MD
Division of Infectious Diseases, Department of Internal Medicine, Emory University School of Medicine, Atlanta, Georgia.

Lauren F. Collins, MD
Division of Infectious Diseases, Department of Internal Medicine, Emory University School of Medicine, Atlanta, Georgia.

Preeti Malani, MD, MSJ
Division of Infectious Diseases, Department of Internal Medicine, University of Michigan, Ann Arbor; and Associate Editor, *JAMA*.



Long-term Health Consequences of COVID-19

With more than 30 million documented infections and 1 million deaths worldwide, the coronavirus disease 2019 (COVID-19) pandemic continues unabated. The clinical spectrum of severe acute respiratory syndrome coronavirus (SARS-CoV) 2 infection ranges from asymptomatic infection to life-threatening and fatal disease. Current estimates are that approximately 20 million people globally have “recovered”; however, clinicians are observing and reading reports of patients with persistent severe symptoms and even substantial end-organ dysfunction after SARS-CoV-2 infection. Because COVID-19 is a new disease, much about the clinical course remains uncertain—in particular, the possible long-term health consequences, if any.

Epidemiology

Currently, there is no consensus definition of postacute COVID-19. Based on the COVID Symptom Study, in which more than 4 million people in the US, UK and Sweden have entered their symptoms after a COVID-19 diagnosis, postacute COVID-19 is defined as the presence of

tion among a random sample of 292 adults (≥ 18 years) who had a positive outpatient test result for SARS-CoV-2 by reverse transcriptase-polymerase chain reaction, 35% of 274 symptomatic respondents reported not having returned to their usual state of health 2 weeks or more after testing, including 26% among those aged 18-34 years ($n = 85$), 32% among those aged 35-49 years ($n = 96$), and 47% among those aged 50 years or older ($n = 89$).⁴ Older than 50 years and the presence of 3 or more chronic medical conditions were associated with not returning to usual health within 14 to 21 days after receiving a positive test result. Notwithstanding, 1 in 5 individuals aged 18-34 years without chronic medical conditions had not yet achieved baseline health when interviewed at a median of 16 days from the testing date.

Manifestations

The most commonly reported symptoms after acute COVID-19 are fatigue and dyspnea. Other common symptoms include joint pain and chest pain.³ In addition to these general symptoms, specific organ dysfunction has been reported, involving primarily the heart, lungs, and brain. From a pathogenesis standpoint, these complications could be the consequence of direct tissue invasion by the virus (possibly mediated by the presence of angiotensin-converting enzyme 2 receptor), profound inflammation and cytokine storm, related immune system dam-

Longer-ranging longitudinal observational studies and clinical trials will be critical to elucidate the...health consequences attributable to COVID-19 and how these may compare with other serious illnesses.

Data

MMWR: Symptom Duration & Risk Factors for Delayed Return to Usual Health, March–June 2020

Tenforde MW, et al. MMWR / July 31, 2020 / 69(30);993-998

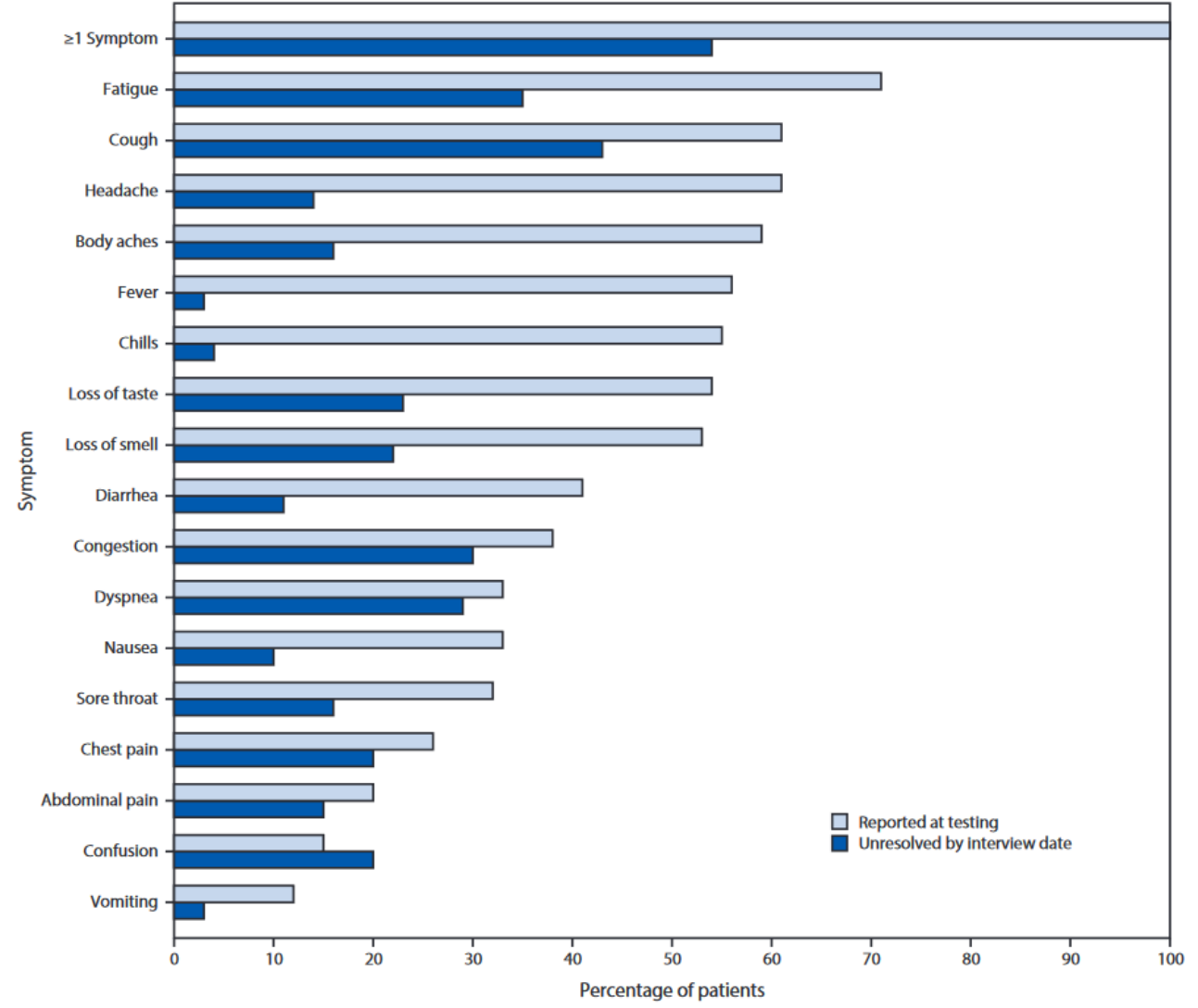
- Assess prolonged symptoms among outpatients; 14 US academic health systems, 13 states
- April-June 2020; adults > 18 yrs; first + RT-PCR; random sample; phone interviews; median 16 days after test date
- Results:
 - 292 respondents: 94% (274) reported experiencing one or more symptoms at the time of testing; 35% of symptomatic persons had not returned to usual state of health by the date of the interview (median—16 days since test)
 - 18-34 yrs: 26%
 - 35-49 yrs: 32%
 - >50 yrs: 47%
 - Continued symptoms: cough 43%, fatigue 35%, shortness of breath 29%

MMWR: Symptom Duration and Risk Factors for Delayed Return to Usual Health, March–June 2020

- Persistence of symptoms correlated with presence of comorbidities:
 - 0-1 comorbidities: 28%
 - 2 comorbidities: 46%
 - 3 comorbidities: 57%
- Age and comorbidities: independent predictors of continued symptoms
- Among 274 symptomatic outpatients, median number of symptoms: seven
 - Fatigue (71%), cough (61%), headache (61%) most common

Tenforde MW, et al. *Weekly* / July 31, 2020 / 69(30);993-998

FIGURE. Self-reported symptoms at the time of positive SARS-CoV-2 reverse transcription–polymerase chain reaction (RT-PCR) testing results and unresolved symptoms 14–21 days later among outpatients (N = 274)* — 14 academic health care systems,† United States, March–June 2020

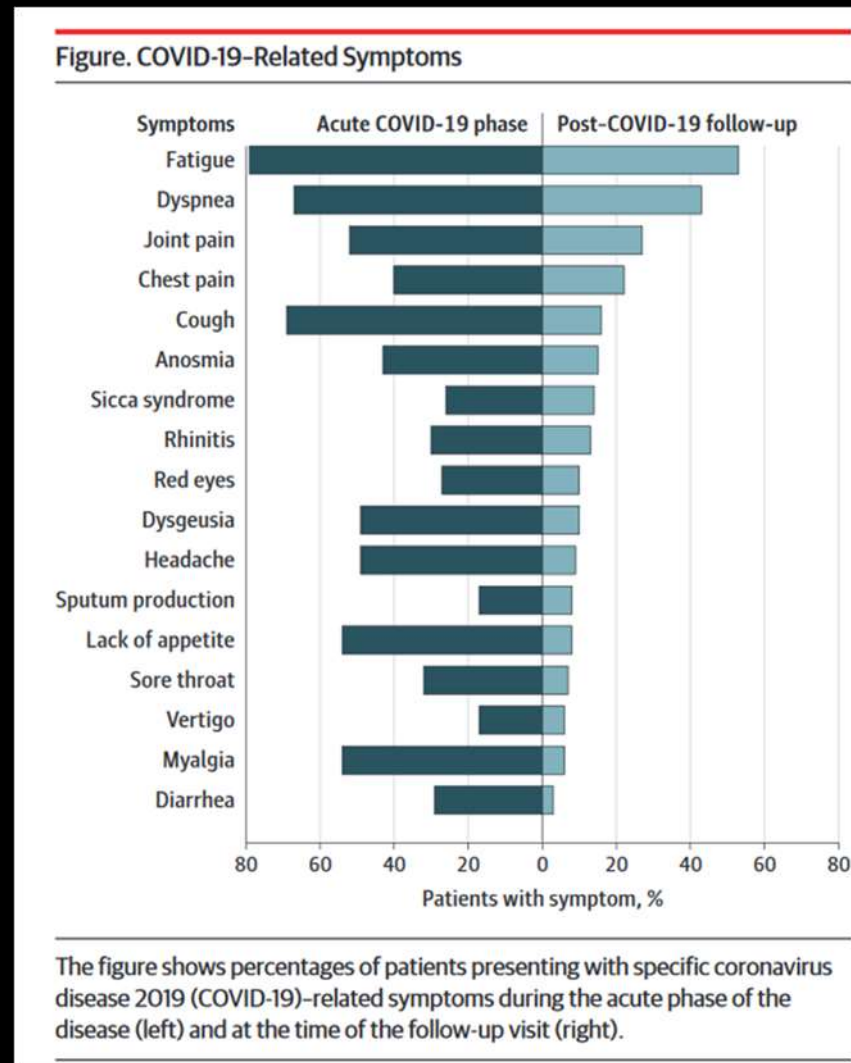


Persistent symptoms after COVID-19

- Post-care assessment of symptoms in patients with COVID-19 in Rome
- April–May 2020; post-acute outpatient service for discharged patients; 2 negative RT-PCR tests
- Results:
 - N = 143
 - Mean age 56.6, 37% female
 - During hospitalization: 72.7% evidence of interstitial pneumonia; mean length of hospital stay 13.5 days; 15% non-invasive ventilation; 5% mechanical ventilation
 - Mean time at assessment: **60.3 days from first symptom**
 - 87.4% reported persistence of at least one COVID-related symptom
 - 55% had 3+ symptoms; no fever or acute signs of illness
 - Common symptoms: fatigue 53.1%, dyspnea 43.4%, joint pain 27.3%, chest pain 21.7%
 - Worsened quality of life 44.1%

Persistent symptoms in patients after acute COVID-19

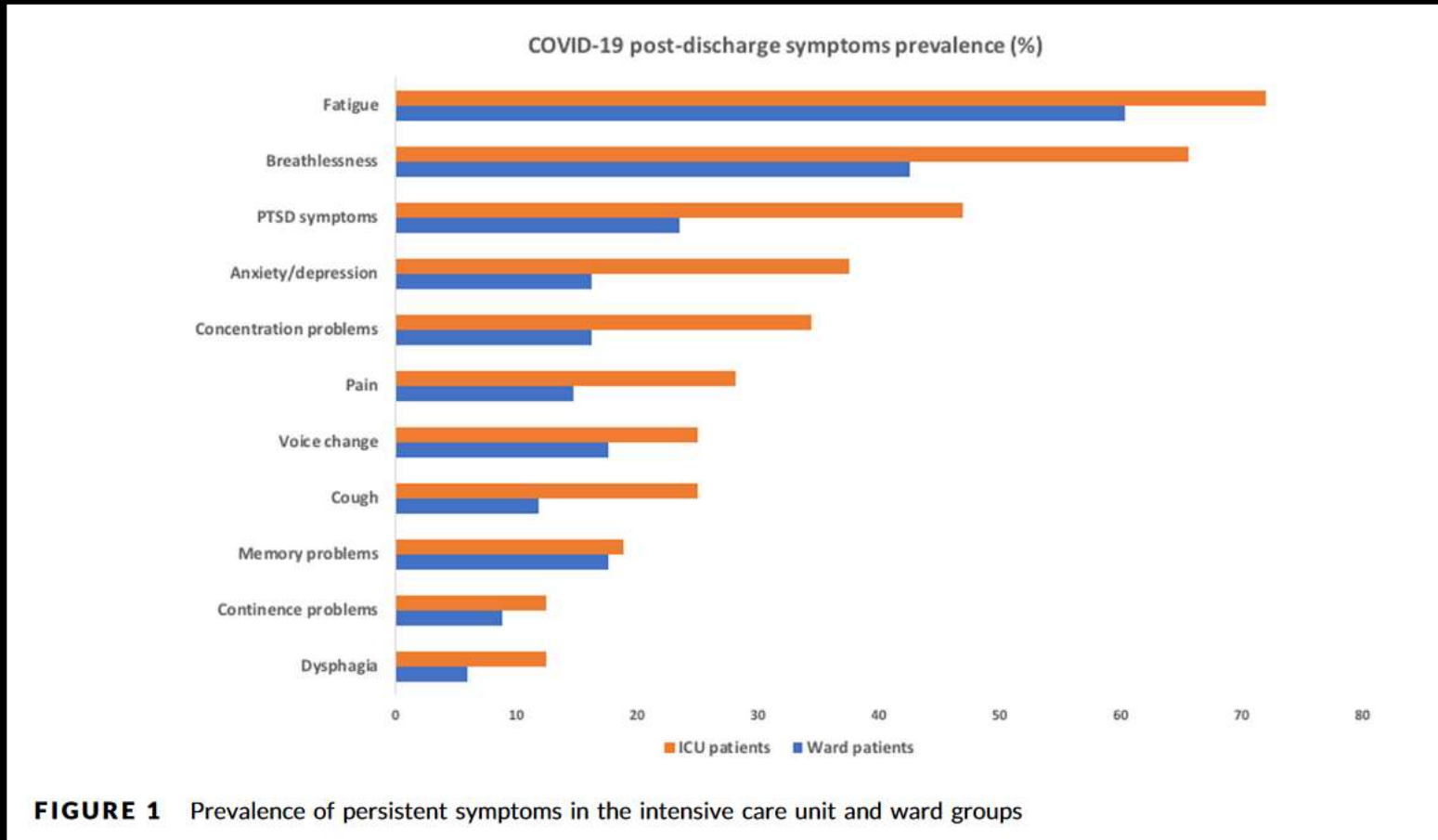
Carfi, et al. JAMA. 2020;324(6):603-605.
doi:10.1001/jama.2020.12603



Post-discharge symptoms and rehab needs in survivors of COVID-19

- Assess the nature & prevalence of post-COVID symptoms after discharge
- Purposive sample 100 survivors, ≥ 18 yrs old, discharged from a University hospital (UK), assessed 4-8 weeks after discharge, telephone screening tool
- Results:
 - 48 days post-discharge (29-71 days)
 - 32 treated in ICU (mean age 58.5, 40.6% women), 68 on wards (mean age 70.5, 48.5% women)
 - New fatigue most common symptom (72% ICU group, 60.3% ward group)
 - Breathlessness (65.6% ICU group, 42.6% ward group)
 - Psychological distress (46.9% ICU group, 23.5 ward group)
 - Drop EQ5D (68.8% ICU group, 45.6% ward group)—assessed mobility, personal care, usual activities, pain, anxiety/depression

Post-discharge symptoms and rehab needs in survivors of COVID-19



Halpin SJ, et al. J Med Virol. 2020;1-10.

Post-discharge persistent symptoms

- Assess post-discharge symptoms, quality of life
- Single-center study (Paris); data obtained via phone questionnaire; 279 hospitalized March-April 2020 (excluded: unreachable, non-French speaking, dementia, declined)
- Results: N=120, mean **110.9 days since admission**
- Fatigue 55%, dyspnea 42%, loss of memory 34%, sleep disorders 30.8%, concentration 28%, loss of hair 20% (20 women, 4 men)
 - No statistical differences between ICU vs. ward patients
- Of pre-COVID active workers (46.7% of total): 69.1% had returned to work; 71.8% had returned to regular sports activities but at a lower level

Follow-up adults with non-critical COVID-19 60 days after symptom onset

- Describe clinical evolution & predictors of symptom persistence at D30 and D60 in patients with initial non-critical COVID-19 confirmed by RT-PCR
- University Hospital, Tours, France; N=150, March-June 2020; D30 & D60 follow-up by EHR and phone call
- 68% with at least one symptom (D30), 66% (D60)
 - Anosmia/ageusia: 59% at onset, 28% (D30), 23% (D60)
 - Dyspnea: 36.7% (D30), 30% (D60)
 - Asthenia: 50% (D30), 40% (D60)
- Persistent symptoms D30: severe COVID-19, dyspnea at symptom onset
- Persistent symptoms D60: age 40-60 years, hospital admission, abnormal auscultation at symptom onset

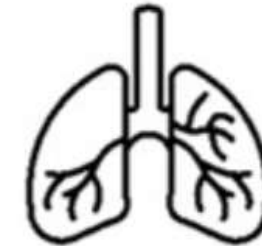
	Tenforde	Carfi	Garrigues	Halpin	Carvalho-Schneider
Patients	Ambulatory	Hospitalized	Hospitalized	Hospitalized	Non-critical
Time since dx	14-28 d	60d post onset	110d post DC	4-8 wks post DC	30d, 60d post onset
Not returned to baseline	35%				68% D30, 66% D60
No COVID sx		12.6%			
Cough	42%		16.7%	Ward ~12%, ICU ~25%	
Fatigue	35%	53.1%	55%	Ward ~60%, ICU ~72%	36% D30, 21% D60
Dyspnea	29%	43.4%	42%	Ward ~43%, ICU ~66%	11% D30, 8% D60
Fever		none			
Joint pain		27.3%			10% D30, 16% D60
Anosmia		13%	13.3%		28% D30, 23% D60
Memory loss			34%	Ward 16%, ICU 18%	
Worse mental health			yes	yes	
Worse physical health			yes	yes	

LATE SEQUELAE

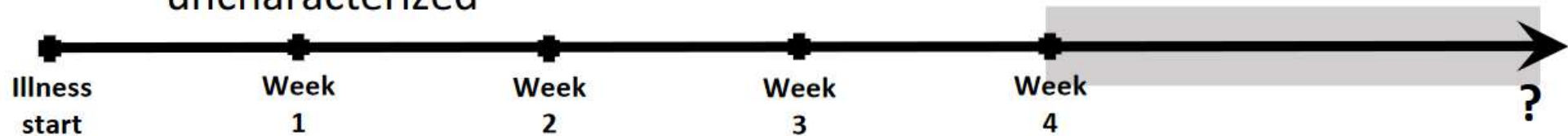
Commonly see cardiovascular, pulmonary, and central nervous system manifestations⁷⁻¹²



Pathophysiological pathways are proposed, but *unproven*



Laboratory tests:
Viral test, Antibody profile uncharacterized





¹ Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford OX2 6GG, UK

² West Hertfordshire Hospitals NHS Trust, Watford, UK

³ West Hertfordshire Respiratory Service – Central London Community Healthcare, London, UK

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Cite this as: *BMJ* 2020;370:m3026

<http://dx.doi.org/10.1136/bmj.m3026>

Published: 11 August 2020

PRACTICE POINTER

Management of post-acute covid-19 in primary care

Trisha Greenhalgh,¹ Matthew Knight,² Christine A'Court,¹ Maria Buxton,³ Laiba Husain¹

What you need to know

- Management of covid-19 after the first three weeks is currently based on limited evidence
- Approximately 10% of people experience prolonged illness after covid-19
- Many such patients recover spontaneously (if slowly) with holistic support, rest, symptomatic treatment, and gradual increase in activity
- Home pulse oximetry can be helpful in monitoring breathlessness
- Indications for specialist assessment include clinical concern along with respiratory, cardiac, or neurological symptoms that are new, persistent, or progressive

Box 1: A patient's account

My wife, kids, and I all had symptoms of presumed covid-19 in early April 2020. They were soon fine, but I was more unwell and ended up in bed extremely fatigued, lethargic, and without appetite for four days.

The only person whose symptoms persisted was myself, and the fatigue which I had experienced was still lingering in the background. From this point onwards, it became difficult to engage fully in day to day activities with my normal energy levels. Exercise, of which I do a fair amount, was not at all possible.

I continued to feel like this for another three weeks, before finally feeling completely overwhelmed. This happened very quickly and without warning, resulting in me heading for bed immediately as I felt so bad. For the next 72 hours, I felt unwell in a way that was bordering

“...honoring the story of the patient...”

COVID-19 Real-Time Learning Network

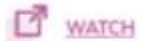
Stay up to date on COVID-19 disease manifestations and complications.



Multimedia

Management of post-COVID Symptoms: Experiences from the Center for Post-COVID Care in NYC

An American Thoracic Society COVID-19 Critical Care Training Forum discussion with physicians who helped organize Mt. Sinai's Center for Post-COVID Care about the most common and uncommon symptoms they have encountered.



15 Sep

Podcast - Managing Patients Post-COVID-19: From Symptoms to Lasting Complications

Drs. Robin Trotman of Cox Health and Inessa Gendlina of Montefiore Medical Center discuss the long-term effects of COVID-19 and how to manage recovered patients.



01 Sep

COVID-19 Podcast: Survivors of COVID-19 (June 13, 2020)

"There was no sense of what was coming next." Drs. Buddy Creech & Anna Person of Vanderbilt University & Michael Saag of the University of Alabama share their experiences as physicians infected with COVID-19.



13 Jun

Post-Acute COVID-19 Syndrome

<https://www.idsociety.org/covid-19-real-time-learning-network/disease-manifestations--complications/post-covid-syndrome/>

What about the heart?

Outcomes of Cardiovascular Magnetic Resonance Imaging in Patients Recently Recovered From Coronavirus Disease 2019 (COVID-19)

Valentina O. Puntmann, MD, PhD; M. Ludovica Carerj, MD; Imke Wieters, MD; Masia Fahim; Christophe Arendt, MD; Jędrzej Hoffmann, MD; Anastasia Shchendrygina, MD, PhD; Felicitas Escher, MD; Mariuca Vasa-Nicotera, MD; Andreas M. Zeiher, MD; Maria Vehreschild, MD; Eike Nagel, MD

 Editorial

 Supplemental content

IMPORTANCE Coronavirus disease 2019 (COVID-19) continues to cause considerable morbidity and mortality worldwide. Case reports of hospitalized patients suggest that COVID-19 prominently affects the cardiovascular system, but the overall impact remains unknown.

OBJECTIVE To evaluate the presence of myocardial injury in unselected patients recently recovered from COVID-19 illness.

DESIGN, SETTING, AND PARTICIPANTS In this prospective observational cohort study, 100 patients recently recovered from COVID-19 illness were identified from the University Hospital Frankfurt COVID-19 Registry between April and June 2020.

EXPOSURE Recent recovery from severe acute respiratory syndrome coronavirus 2 infection, as determined by reverse transcription-polymerase chain reaction on swab test of the upper respiratory tract.

MAIN OUTCOMES AND MEASURES Demographic characteristics, cardiac blood markers, and cardiovascular magnetic resonance (CMR) imaging were obtained. Comparisons were made with age-matched and sex-matched control groups of healthy volunteers (n = 50) and risk factor-matched patients (n = 57).

RESULTS Of the 100 included patients, 53 (53%) were male, and the mean (SD) age was 49 (14) years. The median (IQR) time interval between COVID-19 diagnosis and CMR was 71 (64-92) days. Of the 100 patients recently recovered from COVID-19, 67 (67%) recovered at

- Frankfurt, 100 patients
- Age-matched & sex-matched control groups healthy volunteers plus risk factor-matched patients; 1/3 hospitalized
- Cardiac blood markers, cardiovascular magnetic resonance (CMR) imaging
- 53% male, mean age 49 yrs
- Median time from diagnosis to CMR: 71 days
- hsTnT >3 pg/mL in 71%, >13.9 in 5%
- **78 abnormal CMR:**
 - Raised myocardial native T1 71%
 - Raised native T2 60%
 - Late gadolinium enhancement 32%
 - Pericardial enhancement 22%
- Endomyocardial biopsy in severe findings: active lymphocytic infiltration
- Native T1 and T2: best discriminators to detect COVID-19-related pathology

Letters

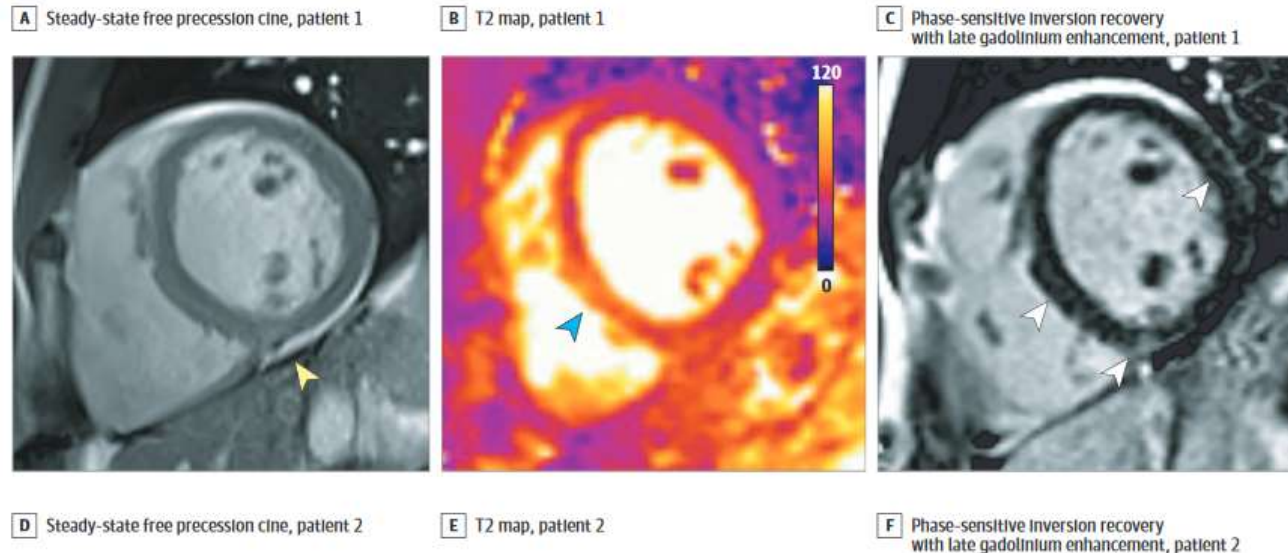
RESEARCH LETTER

Cardiovascular Magnetic Resonance Findings in Competitive Athletes Recovering From COVID-19 Infection

Myocarditis is a significant cause of sudden cardiac death in competitive athletes and can occur with normal ventricular function.¹ Recent studies have raised concerns of myocardial inflammation after recovery from coronavirus disease 2019 (COVID-19), even in asymptomatic or mildly symptomatic patients.² Our objective was to investigate the use of cardiac magnetic resonance (CMR) imaging in competitive athletes recovered from COVID-19 to detect myocardial inflammation that would identify high-risk athletes for return to competitive play.

Methods | We performed a comprehensive CMR examination including cine, T1 and T2 mapping, extracellular volume fraction, and late gadolinium enhancement (LGE), on a 1.5-T scanner (Magnetom Sola; Siemens Healthineers) using standardized protocols,³ in all competitive athletes referred to the sports medicine clinic after testing positive for COVID-19 (reverse transcriptase-polymerase chain reaction) between June and August 2020. The Ohio State University institutional review board approved the study, and informed consent in writing was obtained from participating athletes. Cardiac magnetic resonance imaging was performed after recommended quarantine (11-53 days). Electrocardiogram, serum troponin I, and transthoracic echocardiogram were performed on day of CMR imaging.

Figure. Cardiovascular Magnetic Resonance Findings in Competitive Athletes Recovering From Coronavirus Disease 2019 Infection



- Ohio State, 26 athletes, 57% male
- Football, basketball, soccer, lacrosse, track
- All outpatient; 12 mild symptoms only
- Evaluated 11-53 days after quarantine
- EKG: without ST/T changes
- Troponin I: normal
- TTE & CMR: ventricular volumes & fxn WNL
- 4: signs of myocarditis on CMR (elevated T2 signal + late gadolinium enhancement)
 - 2 with mild symptoms only
- 8 with LGE but without T2 → prior myocardial injury

10/26/2020

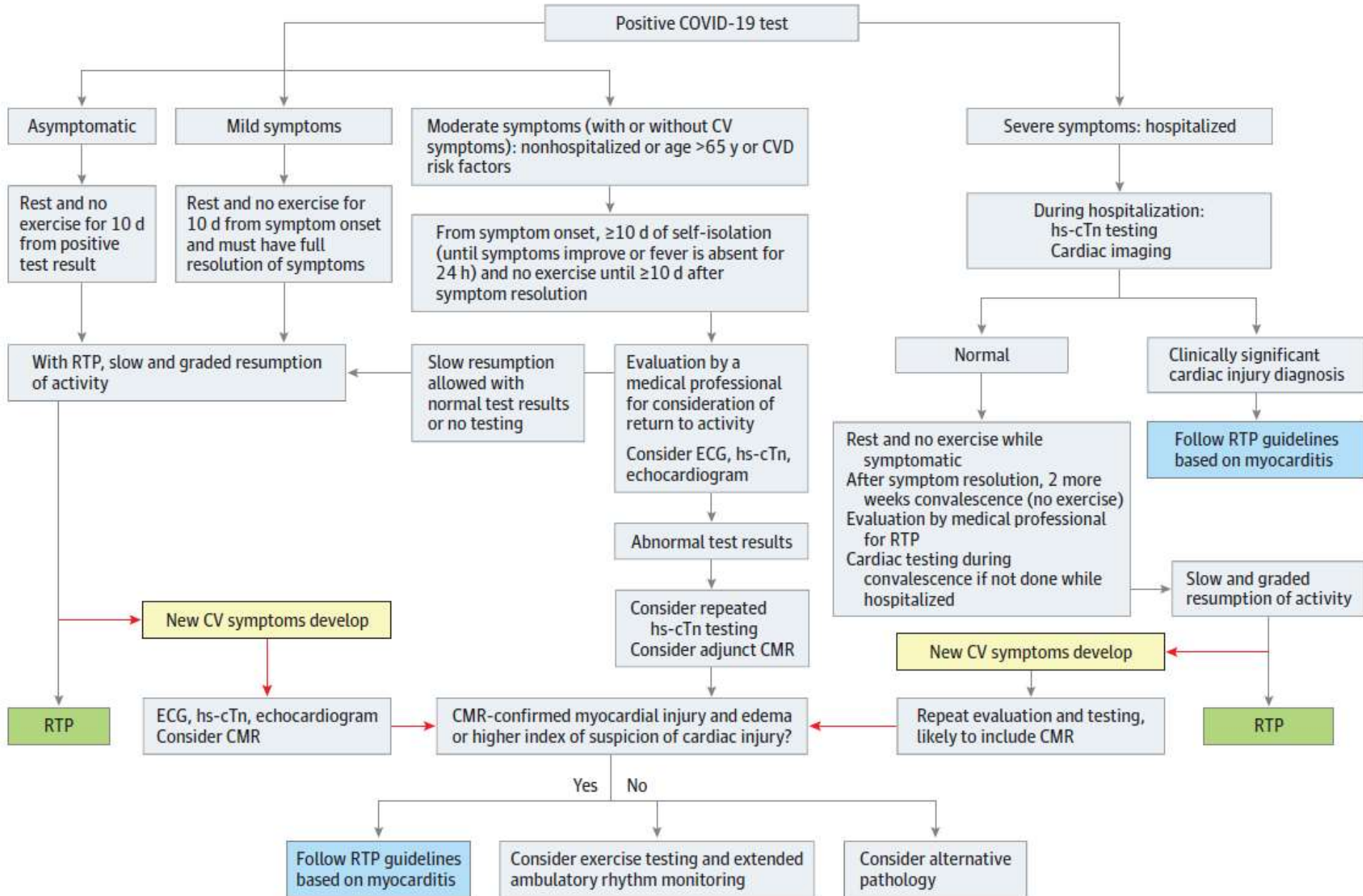
Clinical Review & Education

JAMA Cardiology | Special Communication

Coronavirus Disease 2019 and the Athletic Heart Emerging Perspectives on Pathology, Risks, and Return to Play

Jonathan H. Kim, MD, MSc; Benjamin D. Levine, MD; Dermot Phelan, MD, PhD; Michael S. Emery, MD, MS;
Mathew W. Martinez, MD; Eugene H. Chung, MD, MSc; Paul D. Thompson, MD; Aaron L. Baggish, MD

Figure 2. Proposed Coronavirus Disease 2019 (COVID-19) Return-to-Play Algorithm for Recreational Masters Athletes



10/26/2020

Opinion

EDITORIAL

Return to Play for Athletes After Coronavirus Disease 2019 Infection— Making High-Stakes Recommendations as Data Evolve

James E. Udelson, MD; Michael A. Curtis, MEd, CSCS; Ethan J. Rowin, MD

As the coronavirus disease 2019 (COVID-19) pandemic began to evolve, case reports suggested that a clinical syndrome con-

of athletes with positive COVID-19 test results on collegiate or professional teams or athletes with high profiles who have posi-

Patient advocacy

For example...Body Politic COVID-19 Support Group

- COVID-19 patients created, analyzed a survey targeted at patients experiencing symptoms for over two weeks
 - 640 responses; April 21 and May 2, 2020
- “While we acknowledge that this analysis pertains to a ***biased sample of patients with higher recovery times than typically reported***, we hope the report will inform public health professionals, inspire future research, and give family, friends, employers, and the general public deeper insight into the range of experiences of people living with COVID-19.”

<https://bit.ly/bp-covid-survey-analysis>

<https://www.wearebodypolitic.com/bodytype/2020/8/16/covid-19-support-group-long-haul>

<https://www.theatlantic.com/health/archive/2020/08/long-haulers-covid-19-recognition-support-groups-symptoms/615382/>

From Body Politic: survey results

- Women more commonly affected than men (bias: more likely to participate in Body Politic and the survey)
- Symptomatic/more severely ill patients: more likely to develop prolonged symptoms
- Even those not hospitalized may experience prolonged symptoms
- Many symptoms suggestive of ***dysautonomia***
 - Perturbations of the autonomic nervous system; damage from virus or an overactive immune system?
 - Post-exertional malaise: e.g., walking up a flight of stairs and then confined to bed for 2 days
 - Likened to myalgic encephalomyelitis (i.e., Chronic Fatigue Syndrome)
 - Managing fatigue “*becomes a full-time job*”

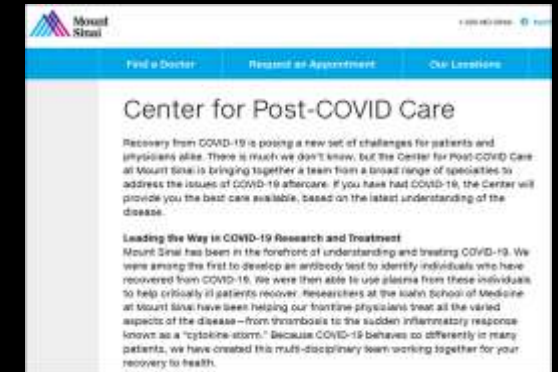


Body Politic— patient quotes

- *“Feel terrible for a week then have 2 good days then back to feeling terrible. And when I say 2 good days that just means I can walk to the kitchen without feeling like I need a break in between. I feel as if I have more of a disability now [than] just some virus bug.”*
- *“I am 20 years old and very active. I see a lot of my friends not taking social distancing seriously because they don’t think it will affect someone of their demographic. Yet here I am, super sick for a month now.”*
- *“I can’t do any [exercise] my HR goes up very quickly and I get shortness of breath.”*

Healthcare and “Post-covid” patients

- Often require care from multiple specialists: pulmonologists, cardiologists, neurologists, rheumatologists, psychiatrists, physical medicine/rehabilitation
 - Not necessarily infectious disease physicians
- New York, Chicago, LA, and other area health systems: launched COVID-19 rehabilitation and recovery programs, to serve as a medical home for patients with myriad complications who require coordinated care



CLINICAL EXPERIENCE

- Wide spectrum of recovery

Feeling well, returning to daily function

Recurrent fever, malaise, chest pain, cognitive dysfunction

- Prolonged recovery
 - COVID vs. new process
 - Role of labs/imaging
 - Vital signs
- Deconditioning
- Anxiety, PTSD
 - Resurgent symptoms
 - Infectivity concerns
 - Far from baseline
- Late complications...?

David Geffen School of Medicine UCLA Health

- Pulse oximeter, BP cuff at home
- Orthostatic vital signs
- Patients not the same as at admission
- Neurologic/psychiatric changes
- Residual pulmonary symptoms

COVID-19 Lessons from the Front Line: Transitions and Care of the Post-Discharge Patient

Screening for post-covid syndrome?

- No data yet, hopefully soon
- Yes, athletes, strenuous exercise: do screen these people with exam, cardiac eval, forced rest period, then re-eval; watch evolving data
- Anxiety/depression screens, especially in older persons, perhaps those in ICU: not unreasonable to screen them
 - More subtle deficiencies in concentration—needs to be studied
- Setting up a clinic: consider the goal. Address patients' concerns; also valuable research opportunities
- Patients want someone to listen and to be validated

Late sequelae: pathogenesis hypotheses

- Organ damage from acute infection
 - Pulmonary fibrosis?
 - Cardiac scarring?
- Manifestations of long-term hyperinflammatory state
- Persistent virus in protected reservoir (like Ebola) with ongoing viral activity
- Post- ICU syndrome?
 - Slow resolution of symptoms, PTSD, memory/concentration

ddatta@cdc.gov

Open questions

- What is the burden of disease?
- Who are the vulnerable individuals?
- What are the risk factors for prolonged complications/sequelae?
- What is the underlying pathophysiology?
- What are the best approaches for management?
- What is the duration of illness?
- How should “recovery” be defined?
- What is the long-term prognosis?
- What are the long-term effects after pediatric infection?

Concluding comments



Listen

Patients will tell us what is wrong

Do not ever underestimate the potential of the pandemic

Always must do ethically sound research during the outbreak

Be flexible and humble enough to change guidelines and policies as the data evolves

Make a commitment to address the social determinants health

Anthony Fauci, MD, MACP | 10 September 2020

Conclusions

- Persistence of symptoms is common after symptomatic COVID-19
 - More common in hospitalized, severely ill, older, those with co-morbidities
- Most common: fatigue, dyspnea, cough
 - Long term fevers uncommon
- Pressing need for ongoing investigation of the long-term cardiovascular consequences of COVID-19
 - Do screen high-performance athletes
- Healthcare systems should consider developing multi-specialty clinics to provide post-COVID-19 care
- High-quality research is necessary, especially in a pandemic

Thank you

