



Royal College of  
General Practitioners

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# COVID-19, Syncope and PoTS

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## Summary

There have been case reports of patients with COVID-19 presenting with syncope. This article reviews the importance of syncope in detecting and risk assessing affected patients, and especially children with paediatric multisystem inflammatory syndrome, and care home patients. There is emerging evidence that autonomic dysfunction including postural tachycardia syndrome (PoTS) may be a treatable manifestation of post-COVID syndromes.

## Acute COVID-19 and Syncope

In terms of respiratory disease, NICE COVID-19 guidance<sup>1</sup> highlights the presence of syncope as a marker of severe illness in suspected cases of pneumonia in the community, aiming to guide decision making around hospital admission.

As the COVID-19 pandemic has progressed there have been increasing case reports of atypical COVID-19 presentations with non-respiratory symptoms and signs including syncope<sup>2</sup>.

It is likely that patients will present to primary care services with these atypical features and GPs will need a high index of suspicion to enable rapid identification, testing and isolation of patients in line with current public health measures.

GPs working in care homes should be especially vigilant as it is recognised that older patients are more likely to develop these atypical signs and symptoms of COVID-19<sup>3</sup>.

Syncope linked to COVID-19 has been described in a range of healthcare settings.

1. An observational study of COVID-19 in primary care showed that syncope was significantly associated with eventual positive diagnosis<sup>4</sup>.
2. A retrospective case series of patients admitted to hospital with COVID-19 reported syncope as a presenting symptom in 4.8% of patients<sup>5</sup> compared with a general prevalence of 1 - 2% in patients presenting with syncope to emergency departments<sup>6</sup>.
3. One case series has described syncope as the only symptom of COVID-19 infection<sup>7</sup>, and this was shown not to be secondary to an underlying arrhythmia nor structural heart or lung disease.

Syncope has also been highlighted as a feature in children with paediatric multisystem inflammatory syndrome temporarily associated with COVID-19 (PIMS-TS)<sup>8</sup>. Although rare, the symptoms of PIMS-TS are estimated to occur 2 - 4 weeks after COVID-19 infection and thus cases may present to clinicians in primary care.

The proposed mechanisms of syncope in patients with COVID-19 are varied and include



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4. A neurally mediated mechanism linked to an 'inappropriate' sinus tachycardia with COVID-19<sup>9</sup>
  5. Autonomic dysfunction due to the virus itself or an autoimmune autonomic neuropathy<sup>7</sup>
  6. Cytokine storm causing vascular injury and vasodilatation<sup>10</sup>
  7. Intense coughing triggering reflex syncope<sup>11</sup>
  8. Dehydration and gastrointestinal fluid loss exacerbating orthostatic hypotension<sup>11</sup>
  9. COVID 19 inducing new cardiac pathology or exacerbating underlying cardiovascular disease<sup>2</sup>.

### **Autonomic dysfunction and ongoing symptomatic / post-COVID-19**

GPs are increasingly providing care for patients recovering from acute COVID-19 and with the emergence of post-COVID-19<sup>2</sup>, it is important to note that the European Academy of Neurology have suggested that orthostatic hypotension and postural tachycardia syndrome (PoTS) may occur in affected patients<sup>11</sup>.

New [NICE guidance](#) on COVID-19 rapid guideline: managing the long-term effects of COVID-19 [NG188] made the following recommendation: 'For people with postural symptoms, for example palpitations or dizziness on standing, carry out lying and standing blood pressure and heart rate recordings (3-minute active stand test, or 10 minutes if you suspect postural tachycardia syndrome, or other forms of autonomic dysfunction).'<sup>13</sup> Further information on diagnosing and managing PoTS can be found [here](#).

As new evidence continues to emerge<sup>14</sup>, multicentre research is required to further investigate the relationship between COVID-19, syncope, PoTS and other forms of autonomic dysfunction. Navigating uncertainty is a strength of general practice and we hope this newsletter raises awareness of these features in COVID-19, helping to promote rapid diagnosis and successful management of this disease.

The new RCGP [Syncope Toolkit and e-learning module](#) contains further information on diagnosis and management of syncope and orthostatic hypotension.



## References

1. National Institute for Health and Care Excellence (2020) COVID-19 rapid guideline: managing suspected or confirmed pneumonia in adults in the community. (NICE guideline NG165).  
<https://www.nice.org.uk/guidance/ng165/chapter/3-Diagnosis-and-assessment>
2. Coleman JJ, Manavi K, Marson EJ, *et al* COVID-19: to be or not to be; that is the diagnostic question *Postgraduate Medical Journal* 2020;96:392-398.
3. Shahid Z, Kalayanamitra R, McClafferty B *et al*. COVID- 19 and older adults: what we know. *J Am Geriatr Soc* 2020; 68: 926-929.
4. Barak Mizrahi, Smadar Shilo, Hagai Rossman, Nir Kalkstein, Karni Marcus, Yael Barer, Ayya Keshet, Na'ama Shamir-Stein, Varda Shalev, Anat Ekka Zohar, Gabriel Chodick, Eran Segal. Longitudinal symptom dynamics of COVID-19 infection in primary care medRxiv 2020.07.13.20151795; doi:  
<https://doi.org/10.1101/2020.07.13.20151795>
5. Argenziano Michael G, Bruce Samuel L, SlaterCody L, Tiao Jonathan R, Baldwin Matthew R, Barr R Graham *et al*. Characterization and clinical course of 1000 patients with coronavirus disease 2019 in New York: retrospective case series *BMJ* 2020; 369 :m1996
6. Sun BC, Emond JA, Camargo CA., Jr Direct medical costs of syncope-related hospitalizations in the United States. *Am J Cardiol.* 2005;95:668–71.
7. Ebrille E, Lucciola MT, Amellone C, Ballocca F, Orlando F, Giammaria M. Syncope as the presenting symptom of COVID-19 infection [published online ahead of print, 2020 May 5]. *HeartRhythm Case Rep.* 2020;6(7):363-366.  
doi:10.1016/j.hrcr.2020.04.015
8. Guidance: Paediatric multisystem inflammatory syndrome temporally associated with COVID-19. Royal College of Paediatrics and Child Health.  
<https://www.rcpch.ac.uk/sites/default/files/2020-05/COVID-19-Paediatric-multisystem-%20inflammatory%20syndrome-20200501.pdf>
9. Lakkireddy DR, Chung MK, Gopinathannair R, *et al*. Guidance for cardiac electrophysiology during the coronavirus (COVID-19) pandemic from the Heart Rhythm Society COVID-19 Task Force; Electrophysiology Section of the American College of Cardiology; and the Electrocardiography and Arrhythmias Committee of the Council on Clinical Cardiology, American Heart Association



[published online ahead of print April 1, 2020]. Heart Rhythm,  
<https://doi.org/10.1016/j.hrthm.2020.03.028>

10. McGonagle D, Sharif K, O'Regan A, Bridgewood C. The role of cytokines including interleukin-6 in COVID-19 induced pneumonia and macrophage activation syndrome-like disease, *Autoimmun Rev* 2020;19(6):102637.
11. COVID-19: statement by the Autonomic nervous system disorders Scientific Panel, April 17, 2020. <https://www.eanpages.org/2020/04/17/covid-19-statement-by-the-autonomic-nervous-system-disorders-scientific-panel>
12. <https://blogs.bmj.com/bmj/2020/06/23/paul-garner-covid-19-at-14-weeks-phantom-speed-cameras-unknown-limits-and-harsh-penalties/>
13. COVID-19 rapid guideline: managing the long-term effects of COVID-19 NICE guideline [NG188] Published date: 18 December 2020  
<https://www.nice.org.uk/guidance/ng188>
14. Miglis M.G. et al, A case report of postural tachycardia syndrome after COVID-19. *Clin Auton Res.* 2020; 30: 449-451

## Authors

- Dr Harjeevan Gill, RCGP Clinical Fellow, Syncope Spotlight Project
- Prof Lesley Kavi, Syncope Clinical Champion and chair of PoTS UK

## Conflict(s) of interest:

Both authors - payments for educational work by Medtronic  
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