

TOOLKIT GUIDE

Autonomic dysfunction symptoms in the context of prolonged COVID-19 symptoms

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Among the many symptoms reported by patients, some are suggestive of **autonomic dysfunction (impairment of the autonomic nervous system)**.

These **symptoms** take on a wide variety of forms, potentially in association:

- Vertigo, lipothymia, or even syncope;
- Day or night sweats or, conversely, lack of sweat;
- Tachycardia and/or bradycardia episodes or inability to perform a routine exercise;
- Nausea, vomiting, feeling of incomplete and delayed gastric emptying, swallowing difficulties, diarrhoea or constipation;
- Urine leaks or bladder voiding difficulties or erectile dysfunction;
- Heat regulation disorders (hypothermia, shivering, more rarely hyperthermia);
- Change in skin temperature and colour.

The same patient rarely shows the whole profile and only some symptoms are reported. However, all of these symptoms taken in isolation are not specific to one autonomic nervous system (ANS) disease and can be encountered in many conditions. For this reason, dedicated investigations and a multidisciplinary clinical assessment must be conducted to be able to correlate the patient's complaints with autonomic nervous system impairment. Their severity and duration should result in a specific investigation.

A systematic aetiological analysis should be carried out for any patient presenting with autonomic dysfunction, especially in the case of subacute onset, primarily to detect a cause: toxic (alcohol, medicinal products), autoimmune, infectious, paraneoplastic, amyloid neuropathy.

Other causes of chronic onset are conventional (diabetes, Parkinson's disease, etc.).

Clinical tests and additional investigations

When presented with these different profiles, clinical tests and various additional investigations are used to study the sympathetic or parasympathetic pathway.

The simplest screening tests to carry out at a medical practice are certain cardiac autonomic dysfunction tests, on a patient in a calm setting for 10 minutes:

- ➔ **For the sympathetic pathway:** screening for orthostatic hypotension (drop of at least 20 mm Hg in SBP and at least 10 mm Hg in DBP after 1 or 3 minutes of orthostatism) without pulse acceleration (besides any bradycardiac medication); the recording can be supplemented by ABP monitoring.
- ➔ For the parasympathetic pathway using a pulse oximeter, screening for a decrease in respiratory arrhythmia:
 - Heart rate rises when inhaling and falls when exhaling.
 - This variability is ideally determined with a continuous ECG recording.
 - It can be performed in a medical practice after a rest period of 15 minutes. In the recumbent position, the patient completes 6 deep breathing cycles (6 inhalations and 6 exhalations) in 1 minute.
 - The difference between the maximum inspiratory heart rate and the minimum expiratory heart rate should be > 10. This difference is pathological if it is < 10. As the test needs to be repeated 3 times, the means of the highest heart rates, on one hand, and those of the lowest heart rate, on the other, will be used.

If these tests are normal and if autonomic dysfunction is still suspected, further tests can be carried out in a specialist setting (cardiology, neurology, neurophysiology).

The means available to alleviate these symptoms, and orthostatic hypotension in particular, are above all non-medicinal

- Explanation of the various symptoms, explanation of symptomatic / aetiological treatment
- List the medicinal products which could exacerbate autonomic dysfunction, to be replaced if possible (beta-blockers, tricyclic antidepressants, alpha-blockers, diuretics)
- Perform isometric contraction exercises of the lower limbs for two minutes before getting up
- Avoid getting up quickly
- Wear an abdominal girdle or support stockings up to the waist
- Sleep in a half-sitting position
- Avoid dehydration
- Drink a large glass of cold water quickly
- Avoid hot environments (e.g. hot shower)
- After a large meal or consuming alcohol, lie down for at least 15 minutes
- Split meals in cases of postprandial arterial hypotension
- Drink water before meals
- Increase salt intake (add 6 g of salt per day to food intake in the absence of high blood pressure (which is rare), heart failure, and kidney failure).

The patient should be referred to a specialist if non-medicinal measures are ineffective, and/or high blood pressure is associated with orthostatic hypotension.

Medicinal strategies (midodrine, domperidone, etc.) may be offered in specialist settings.

Autonomic dysfunction symptoms following acute COVID-19 infection appear to be rare and resolve spontaneously.

Therefore, investigations should not be performed systematically and should be reserved for severe cases.

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