


NEUROLOGICAL MANIFESTATIONS

This information sheet, primarily created for physicians, pharmacists and front-line nursing staff, serves as 1) a management support tool and 2) a source of information. It is provided purely for information purposes and does not seek to replace the clinical judgement of clinicians and professionals who exercise activities reserved for them under specific laws or regulations. The tool's development included a systematic review of accepted clinical practice guidelines at the time it was drafted, and relied on the knowledge, experience and contribution of stakeholders across Québec. See inesss.qc.ca/COVID-19 for further details.


This information sheet complements the general management support tool [Post-COVID-19 conditions](#).

 Review the tool for a general overview of the management of children, adolescents and adults who present with persistent symptoms following a SARS-CoV-2 infection.

GENERAL INFORMATION


- ➔ Neurological manifestations, **frequently** observed in connection with post-COVID-19 conditions, can have a significant impact on a person's functional status. They most often present as **cognitive difficulties**.
- ➔ No **prognosis** has thus far been established for neurological manifestations.
 - The **recovery** period, however, would be **longer** than that for other manifestations of post-COVID-19 conditions.

CLINICAL MANIFESTATIONS

| Categories | Details or examples ¹ (partial list) | |
|---|--|--|
| Sleep disturbances | <ul style="list-style-type: none"> • Circadian disruption • Difficulty falling asleep | <ul style="list-style-type: none"> • Nightmares • Sleep fragmentation |
| Headaches | <ul style="list-style-type: none"> • Migraines | <ul style="list-style-type: none"> • Tension headaches - constant pressure, with fluctuations |
| Cognitive difficulties ² | <ul style="list-style-type: none"> • Changes in reasoning ability • Difficulty concentrating • Difficulty doing two things at once • Forgetting or inverting words • Lack of clarity of thought | <ul style="list-style-type: none"> • Loss of train of thought • Temporary confusion – e.g., a person driving a car forgets where they were headed • Memory loss • Thought process slowdown |
| Altered senses | <ul style="list-style-type: none"> • Altered taste and sense of smell • Blurred vision • Burning sensation • Heightened sensitivity to stimuli – including noise, light, odours and touch | <ul style="list-style-type: none"> • Muscle pain • Neuropathic pain • Paresthesia – focal or diffused, possible fluctuations, including change of position |
| Mobility changes | <ul style="list-style-type: none"> • Difficulty pronouncing or articulating certain syllables • Difficulty writing | <ul style="list-style-type: none"> • Loss of mobility • Muscle weakness |
|  Clinical presentation could change, depending on the SARS-CoV-2 variants and new discoveries. | | |

1. Information is provided in alphabetical order. The frequency of manifestations can vary, based on the characteristics of the populations observed.


2. Cognitive difficulties are often grouped together under the term "mental fog".

-  Subacute neurological manifestations should be given due consideration.
Cognitive difficulties can present themselves after a long or short period executing cognitive tasks and be of very short duration.





 See the management information sheet [Altered taste and sense of smell](#) for specific details regarding these manifestations.

- ➔ **Psychological symptoms** can contribute to neurological manifestations associated with post-COVID-19 conditions.
 - These can be preexisting, a consequence of post-COVID-19 conditions, associated with the pandemic or a result of a combination of any of these factors.

 **Avoid attributing neurological manifestations of post-COVID-19 conditions solely to psychological issues.**

 Disturbances of the autonomic/vegetative nervous system have been reported in the context of post-COVID-19 conditions. Clinical manifestations can impact various systems: cardiac, respiratory, gastrointestinal, genitourinary and vascular. Considered individually, they do not point to a specific dysfunction, but the presence of a few of these could lead to a suspicion (e.g., dizziness, chest pain and nausea). However, these manifestations could also have a number of other causes and these should be investigated as per usual practices.

ASSESSMENT OF THE HEALTH CONDITION

| Elements | Details |
|---|--|
| Characterize neurological manifestations to compare them with the person's baseline status and monitor their evolution. | <ul style="list-style-type: none"> Type of neurological manifestations. Appearance, duration and fluctuations. Treatments or activities that bring relief or exacerbate the manifestations. Effects of prior therapeutic interventions – e.g., medication, occupational therapy, physiotherapy. Impact on the activities of daily living, including the degree of autonomy required to perform them. |
| Look out for possible complications following the acute phase. | <ul style="list-style-type: none"> Examples: encephalopathy, encephalitis, meningitis, cerebrovascular accident, Guillain-Barré syndrome. |
| Seek out and characterize post-exertional malaises to adapt management and monitor their evolution. | <ul style="list-style-type: none"> Impact of introducing an activity (physical, cognitive or emotional) or increasing an activity's intensity on a person's symptoms, energy level and mood. <p> See the management information sheet entitled Post-exertional malaises and fatigue for further details.</p> |
| Look for the presence of factors or conditions , preexisting or not, that could cause, contribute to or exacerbate the neurological manifestations. | <ul style="list-style-type: none"> See the table on page 3. |
| Adapt physical and mental exams on the basis of: <ul style="list-style-type: none"> clinical manifestations; possible conditions; health history. | <ul style="list-style-type: none"> Examples in the case of a neurological exam: <ul style="list-style-type: none"> - cranial nerves; - motor system - muscle strength, tendon reflexes and coordination; - sensory system; - walk and balance; - cognitive functions. <p> As regards post-COVID-19 conditions, results of exams are often normal.</p> |
| Consider to carry out tests and investigations according to the clinical presentation. | <ul style="list-style-type: none"> Cerebral imaging (CT scan or magnetic resonance), an EEG or an EMG should be done on a case by case basis and as per usual practices. These exams should not be routinely requested for every person with neurological manifestations. <p> The results of the tests and investigations are mainly used to rule out other possible conditions. As regards post-COVID-19 conditions, results of common tests and investigations are often normal.</p> |
|  See the management support tool Post-COVID-19 conditions for further information regarding examinations, tests and investigations. | |

Initialisms: EEG: electroencephalogram; EMG: electromyogram.

Factors or conditions, preexisting or not, that could cause, contribute to or exacerbate the neurological manifestations (partial list)

| Categories | Examples ¹ | | |
|-------------------------------------|---|---|--|
| Conditions | <ul style="list-style-type: none"> Autoimmune diseases Brain trauma Cerebral palsy Cerebrovascular accident | <ul style="list-style-type: none"> Chronic headaches Chronic infections Degenerative diseases Endocrine disorders | <ul style="list-style-type: none"> Malignant tumors Metabolic disorders Psychological issues Sleep disorders |
| Physiological factors | <ul style="list-style-type: none"> Fatigue | <ul style="list-style-type: none"> Postpartum depression | <ul style="list-style-type: none"> Pregnancy |
| Lifestyle | <ul style="list-style-type: none"> Consumption of drugs, alcohol, caffeine, etc. Inadequate hydration | <ul style="list-style-type: none"> Lack of sleep Not enough regular exercise | <ul style="list-style-type: none"> Picky or inadequate diet with possible deficiencies |
| Treatments (pharmacological or not) | <ul style="list-style-type: none"> Use of medications affecting the central nervous system | | <ul style="list-style-type: none"> Use of natural products |
| Other factors | <ul style="list-style-type: none"> Adverse reaction to the SARS-CoV-2 vaccine | | <ul style="list-style-type: none"> Psychosocial factors |

1. Information is provided in alphabetical order.

MANAGEMENT

⚠ There is no specific pharmacological treatment for post-COVID-19 conditions.

There is limited data on the use of pharmacological treatments, supplements or natural products in the context of post-COVID-19 conditions. Interventions involving psychological symptoms should aim at supporting recovery rather than being the main objective of the therapeutic approach.

| Situational case management | |
|--|---|
| Situations | Management |
| Presence of factors or conditions that could cause, contribute to or exacerbate the neurological manifestations. | <ul style="list-style-type: none"> Review the relevance of the pharmacological treatment underway and, if needed: <ul style="list-style-type: none"> adjust the dosage; consider turning to another treatment with a different profile, specifically in terms of adverse reactions. Manage conditions according to usual practices. Consider referring the person to: <ul style="list-style-type: none"> a medical specialist as needed, according to the clinical presentation; a mental healthcare professional if necessary. |
| Neurological manifestations WITH NO post-exertional malaises | <ul style="list-style-type: none"> Support the person in managing their symptoms (see the next section). Address neurological manifestations as per the usual practices and monitor the effectiveness of the treatment initiated. Evaluate a possible return to work or school on a case by case basis, once the person's condition is stable and they are able to carry out their activities of daily living and household tasks. <ul style="list-style-type: none"> Evaluate, on a case by case basis, the need for a progressive return to work or school with temporary and personalized accommodations. <p>⚠ Resuming one's prior activities too quickly could extend the recovery period.</p> <ul style="list-style-type: none"> Consider referring the person to : <ul style="list-style-type: none"> a medical specialist or post-COVID-19 clinic¹ nearby (contingent on availability), if: <ul style="list-style-type: none"> the acute infection occurred ≥ 12 weeks ago and the person's health status has significantly deteriorated; the person presents with a condition that suggests an anomaly or a persistent neurological problem. <p>⚠ The usual emergency criteria prevail.</p> <p>i The validation of information by an experienced colleague or through the SAFIR digital counselling platform could also be considered.</p> <ul style="list-style-type: none"> a rehabilitation professional or post-COVID-19 clinic¹ in the case of significant persistent troubles that compromise the person's functional ability, including headaches, pain and cognitive difficulties. <p>📄 See the management information sheet Rehabilitation interventions for information regarding potential support from rehabilitation professionals. (Will be released at the end of summer 2022.)</p> |
| Neurological manifestations WITH post-exertional malaises | <p>📄 See the management information sheet entitled Post-exertional malaises and fatigue to adapt the medical management of the neurological manifestations.</p> |

1. The service offer is expanding.

MANAGEMENT OF SYMPTOMS AND RECOVERY SUPPORT

| Situations | Advices |
|--|--|
| Neurological manifestations WITH NO post-exertional malaises | <ul style="list-style-type: none"> Provide the usual advices as regards the management of symptoms, including sleep disturbances, headaches, neuropathic pain, paresthesia and psychological symptoms. Suggest the use of compensatory strategies to persons with cognitive difficulties, e.g. alarms, calendars, journals (to take notes). <p>See the management support tool Post-COVID-19 conditions for other general advices.</p> |
| Neurological manifestations WITH post-exertional malaises | <p>See the management information sheet entitled Post-exertional malaises and fatigue for advices adapted to the persons' individual health status.</p> |

FOLLOW-UP

→ **While follow-up is important**, there are no specific instructions in the case of neurological manifestations.

⚠ Keeping a daily journal of activities can provoke anxiety in some people, and could be more difficult for those persons with a low triggering threshold of post-exertional malaise.

ℹ Having a loved one present can assist with the retention of information and the education of loved ones on the impacts of post-COVID-19 conditions.

See the general management support tool [Post-COVID-19 conditions](#) for general recommendations.