

POST-COVID-19 CONDITIONS

This tool, 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 tool is complemented by four information sheets that address specific elements of certain manifestations:

- [Altered taste and sense of smell](#)
- [Post-exertional malaises and fatigue](#)
- [Cardiorespiratory manifestations](#)
- [Neurological manifestations](#)

→ The **post-COVID-19 conditions** examined by this tool **correspond** to the health condition of a child, an adolescent or an adult who meets **all three of the following conditions**:

- Initial SARS-CoV-2 infection, confirmed (analyses or investigations) or plausible (epidemiological link).
- Presence of clinical manifestations more than 12 weeks after the initial infection.
- Presence of clinical manifestations that cannot be explained by any other condition and which were not present prior to the infection.

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⚠ **According to the clinical presentation, characterization and management support of clinical manifestations can be contemplated 4 weeks or more after the infection.**

This objective's approach rests on promoting recovery by acting quickly with regard to symptoms that compromise functional abilities (e.g., post-exertional malaises). No conclusion as to a post-COVID-19 condition, however, should be reached prior to 12 weeks after the initial infection.

GENERAL INFORMATION

→ Post-COVID-19 conditions **are not related to the severity of the acute phase** of the infection.¹

→ **The clinical presentation is variable:**

- Persistence of some of the clinical manifestations present during the infection's acute phase, with or without any new manifestations.
- Appearance of clinical manifestations after a remission period subsequent to the acute phase or an asymptomatic infection.

→ Post-COVID-19 conditions **comprise a wide range of physical and mental manifestations** apparent at least 12 weeks after a SARS-CoV-2 infection. These manifestations include complications associated with the prolonged illness, sequelae due to hospitalization or the acute phase.

1. According to the World Health Organization's classification: asymptomatic infection, mild disease (signs and symptoms but absence of signs of viral pneumonia or hypoxia), moderate disease (pneumonia), severe disease (severe pneumonia), critical disease (acute respiratory distress syndrome, sepsis, septic shock, acute thrombosis or multisystem inflammatory syndrome in children).

UNCERTAINTIES

Categories	Observations
Epidemiology	<ul style="list-style-type: none"> The prevalence of clinical manifestations of post-COVID-19 conditions varies from one study to another and from one country to the next, based on the definition of health status adopted, the severity of the initial infection, the sociodemographic characteristics of the persons considered and the duration of follow-up. The impact of SARS-CoV-2 variants on the prevalence of post-COVID-19 conditions is uncertain.
Myalgic encephalomyelitis	<ul style="list-style-type: none"> Some clinical aspects of post-COVID-19 conditions are similar to those associated with myalgic encephalomyelitis. The link, however, cannot be confirmed given the uncertainties regarding the pathophysiology of each of the conditions.
Etiology	<ul style="list-style-type: none"> The pathophysiology of clinical manifestations remains uncertain. A number of hypotheses are currently being considered, and several different mechanisms could be involved, for example, autoimmunity, immune dysregulation, long-term disruption of the microbiota and microclots.
Risk factors	<ul style="list-style-type: none"> Further information on the risk factors for developing a post-COVID-19 condition is becoming known. These include hospitalization and a high number of symptoms at the time of the initial infection. Old age, feminine gender and the presence of comorbidities, among them type 2 diabetes and a severe initial disease¹ (or moderate in the case of children and adolescents)² also seem to increase the risk.
Prognosis	<ul style="list-style-type: none"> There is little hindsight with regards to the course of clinical manifestations. However, some persons have been presenting with signs and symptoms for over two years. No long-term prognosis has been clearly established for most of the manifestations. However, it is usually positive for altered taste and smell. Recovery is different from one person to the next. Although there is limited background and little available data, it appears that: <ul style="list-style-type: none"> a progressive improvement in health status is observed in numerous people up until 12 weeks post-infection; when symptoms persist beyond this 12-week mark, subsequent improvement is uncertain and tends to occur at a slower pace. Recovery in the case of neurological manifestations would be slower than for other clinical manifestations.
Vaccination	<ul style="list-style-type: none"> The impact of vaccination on clinical manifestations of post-COVID-19 conditions is uncertain.

1. According to the World Health Organization's classification, a severe case of COVID-19 corresponds to a severe pneumonia.

2. According to the American Academy of Pediatrics, a moderate case of COVID-19 in children and adolescents corresponds to at least 4 days with a fever >38 °C, a minimum of one week with signs of myalgia, chills or lethargy, and no admission to an ICU; a severe case of COVID-19 corresponds to an infection that called for a stay in the ICU or intubation.

ASSESSMENT OF THE HEALTH CONDITION

OBJECTIVES

- ➔ Determine whether the health status could be due to:
 - complications or sequelae associated with the acute phase of COVID-19;
 - an exacerbation or an aggravation of an existing comorbidity.
- ➔ Eliminate those conditions not associated with COVID-19.

GENERAL INFORMATION

- ➔ Listen and show empathy for the person's worries and concerns.

There are no recognized diagnostic criteria for post-COVID-19 conditions.

Some people may not have had access to a screening test or an antigen test during the acute phase.

CLINICAL MANIFESTATIONS

⚠️ There are no clinical manifestations specific to post-COVID-19 conditions.

Clinical presentation is highly heterogeneous, particularly in terms of symptom type and severity.

Persons with an asymptomatic infection can develop post-COVID-19 conditions.

➔ Clinical manifestations:

- are varied and can involve more than one system;
- can be ongoing or transitory, of variable intensity and morph over time;
- can present in distinct ways in children, adolescents and the elderly.

Elements	Details
<ul style="list-style-type: none"> • Characterize clinical manifestations to compare them with the person's baseline status and monitor their evolution. 	<ul style="list-style-type: none"> • Type of manifestations (see the table below). • 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. • Repercussion on quality of life and mental state.
<ul style="list-style-type: none"> • 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>

Clinical manifestations of post-COVID-19 conditions (partial list)		
Categories ¹	Manifestations ^{1,2}	
Cardiorespiratory	<ul style="list-style-type: none"> • Arrhythmia • Cough • Dyspnea³ 	<ul style="list-style-type: none"> • Orthostatic intolerance • Palpitations • Thoracic discomfort or pain
Dermatologic	<ul style="list-style-type: none"> • Hair loss 	<ul style="list-style-type: none"> • Skin rashes
Gastrointestinal	<ul style="list-style-type: none"> • Abdominal pain • Diarrhea 	<ul style="list-style-type: none"> • Nausea • Vomiting
General	<ul style="list-style-type: none"> • Altered thermoregulation (fever or profuse sweating) • Hypersensitivity to environmental stimuli • Limited tolerance to effort 	<ul style="list-style-type: none"> • Loss of or decrease in appetite • Post-exertional malaises³ • Sustained and debilitating fatigue³
Musculoskeletal	<ul style="list-style-type: none"> • Joint, tendon or muscle pain 	
Neurological	<ul style="list-style-type: none"> • Changes to senses, including altered taste and sense of smell, neuropathic pain and blurred vision • Cognitive difficulties^{3,4}, including memory loss, lack of clarity of thought and difficulty concentrating <p>📄 See the information sheets entitled Neurological manifestations and Altered taste and sense of smell for more examples of these manifestations.</p>	<ul style="list-style-type: none"> • Headaches • Mobility changes, including a difficulty pronouncing or articulating • Sleep disturbances
Otorhinolaryngological	<ul style="list-style-type: none"> • Changes in the voice (e.g., quality, pitch or tone) • Earaches • Difficulty swallowing 	<ul style="list-style-type: none"> • Sore throat • Tinnitus • Vertigo
Psychological	<ul style="list-style-type: none"> • Symptoms of anxiety • Symptoms of depression 	<ul style="list-style-type: none"> • Symptoms of post-traumatic stress
<p>📄 Clinical presentation could change, depending on the SARS-CoV-2 variants and new discoveries.</p>		

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

2. Some symptoms could fall into more than one category, but have been included in a single place to facilitate the production of the table.

3. Signs and symptoms most frequently observed.

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

📄 **Post-exertional malaises:** aggravation of signs and symptoms following exertion, whether it be physical, cognitive or emotional. This aggravation generally manifests itself anywhere from a few to up to 72 hours after an activity, and can last days, weeks or months.

📄 See the information sheet entitled [Post-exertional malaises and fatigue](#) for further details.

- i** 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.

CONDITIONS TO CONSIDER

- i** Several conditions, not mutually exclusive, are described when referring to post-COVID-19 conditions. There are currently no scientific data making it possible to determine whether these conditions are a consequence of the SARS-CoV-2 virus, sequelae from an extended hospitalization or a health condition totally unrelated to COVID-19.

→ The **following list** can be useful when asking questions or conducting exams.

Categories	Manifestations ¹ (partial list)
Cardiovascular	Heart failure, orthostatic hypotension, myocarditis, pericarditis, postural orthostatic tachycardia syndrome
Dermatologic	Alopecia, perniosis, vasomotor disorders
Hematologic	Pulmonary embolism, venous thromboembolism, arterial thrombosis, other hypercoagulation
Neurological	Altered odour and smell, cerebrovascular accident, cognitive impairment, memory disorders, peripheral neuropathies, sleep disorders, transient ischemic attack
Otorhinolaryngological	Hearing loss, hypacusis, tinnitus
Pulmonary	Bronchial hyperactivity, hyperventilation syndrome, interstitial lung disease
Renal	Renal failure
Rheumatologic	Connective tissue disease, fibromyalgia, reactive arthritis, other autoimmune disorders
Mental and behavioural	Anxiety disorder, depression, post-traumatic stress disorder, psychosis
Others	Allergies, anorexia, denutrition, diabetes, comorbidity progression, dysautonomia, effort deconditioning syndrome, gastrointestinal diseases, hepatic conditions, hypothyroidism, malnutrition, mast cell activation syndrome, myalgic encephalomyelitis, new infection – including another SARS-CoV-2 infection, ophthalmologic disorders, pain syndromes, reactivation of other viruses, sexual dysfunction, vitamin D deficiency, urological disorders
i This list is subject to change as new knowledge is obtained.	

1. Information is provided in alphabetical order. Some conditions could fall into more than one category, but have been included in a single place to facilitate the production of the table.

HEALTH HISTORY

Elements	Details
Look out for possible complications or sequelae following the acute phase.	<ul style="list-style-type: none"> • Date of the acute phase. • Clinical manifestations during the acute phase and their degree of severity. • Hospitalization (or not). • Analyses and investigations carried out. • Treatments received and any rehabilitation measures taken.
Look out for factors that could cause, contribute to or exacerbate the observed clinical manifestations.	<ul style="list-style-type: none"> • Lifestyle. • Prior history and comorbidities (physical and mental health). • Medication history. • Personal circumstances, for assessing the psychosocial risks (e.g., family circumstances and financial situation, presence of a caregiver, health concerns, activities of daily living, stigmatization experienced, social dysfunction in child or adolescent – home, school, friends, recreational activities, work).

- i** See the information sheets [Altered taste and sense of smell](#), [Post-exertional malaises and fatigue](#), [Cardiorespiratory manifestations](#) and [Neurological manifestations](#), for **further details** on the factors to look out for, based on observed manifestations.

EXAMINATIONS

Elements	Details
Adapt exams according to: <ul style="list-style-type: none"> clinical manifestations; possible conditions; health history. 	<ul style="list-style-type: none"> Comprehensive physical exam that notably includes: <ul style="list-style-type: none"> weight and any recent changes; temperature; heart rate and blood pressure; respiratory rate and pulmonary auscultation; oxygen saturation at rest and at effort, in the presence of dyspnea or tachypnea. Mental examination.

See the information sheets [Altered taste and sense of smell](#), [Cardiorespiratory manifestations](#) and [Neurological manifestations](#), for **further details** on the examinations to conduct, based on observed manifestations.

As regards post-COVID-19 conditions, results of physical exams are often normal.

TESTS AND INVESTIGATIONS

There are no specific tests or investigations for post-COVID-19 conditions, and no standard workup has yet been defined.

The results of the tests and investigation are mainly used to rule out other possible conditions.

As regards post-COVID-19 conditions, results of common tests and investigations are often normal.

Elements	Details
Consider to carry out tests and investigations.	In the presence of one of the following situations: <ul style="list-style-type: none"> First visit for clinical manifestations. Recent investigations not sufficiently comprehensive to allow for an analysis of the health condition. Significant deterioration in health status since the last visit. <p>According to the clinical presentation, one might consider not ordering tests and investigations during post-infection weeks 4 to 12 since clinical manifestations may improve.</p>
Choose tests and investigations based on: <ul style="list-style-type: none"> clinical manifestations; possible conditions; health history; examination results. 	See the table below. <p>The detection of SARS-CoV-2 antibodies is not very informative, especially because a negative result does not rule out exposure to the virus.</p>

Tests and investigations to be considered

CHOOSE BASED ON THE CLINICAL PRESENTATION - AVOID OVERINVESTIGATING

Basic tests	Specialized tests
Hemogram, electrolytes and renal function <ul style="list-style-type: none"> CBC, Na, K, Mg, Ca, creatinine, urinalysis 	Coagulation disorder <ul style="list-style-type: none"> D-dimer, fibrinogen
Liver function <ul style="list-style-type: none"> ALT test, alkaline phosphatase, total bilirubin 	Myocardial injury <ul style="list-style-type: none"> Troponin
Inflammatory markers <ul style="list-style-type: none"> CRP, ferritin 	<ul style="list-style-type: none"> ALT test, alkaline phosphatase, total bilirubin
Thyroid function <ul style="list-style-type: none"> TSH 	Viral infection, if included in the initial differential diagnosis <ul style="list-style-type: none"> EBV¹, CMV, HIV
Diabetes <ul style="list-style-type: none"> Fasting blood glucose, HbA1c (at least 3 months following the initial infection) 	Rheumatological conditions <ul style="list-style-type: none"> Antinuclear antibodies, anti-cardiolipin antibodies, anti-CCP, CK, rheumatoid factor
Existing comorbidities <ul style="list-style-type: none"> Any test that can be used to check the stability of the comorbidities. 	

Investigations

Category	Details
Pulmonary system	<ul style="list-style-type: none"> Chest x-ray if a pulmonary overload is suspected, pneumonia, persistent desaturation and suspected interstitial lung disease. A chest x-ray might be considered in the case of children and adolescents if anomalies were visible on the x-rays taken at the time of the initial infection.
Cardiovascular system	<ul style="list-style-type: none"> 12-lead ECG if symptoms of cardiac involvement. Echocardiography if elevated NT-proBNP, a picture of overload and pericarditis during the acute phase. <p>i The role of cardiac imaging by magnetic resonance has yet to be defined and falls under a more specialized approach.</p>

ALT: alanine aminotransferase; anti-CCP: anti-cyclic citrullinated peptide; CBC: complete blood count; CK: creatine kinase; CMV: cytomegalovirus; CRP: C-reactive protein; EBV: Epstein-Barr virus; ECG: electrocardiogram; HbA1c: glycosylated hemoglobin; HIV: human immunodeficiency virus; NT-proBNP: N-terminal pro b-type natriuretic peptide; TSH: thyroid-stimulating hormone.

1. The transient reactivation of the virus has been reported among people infected by SARS-CoV-2.

MANAGEMENT

OBJECTIVES

- Decrease the frequency and intensity of clinical manifestations.
- Support the optimal management of clinical manifestations and energy as well as the progressive and safe resumption of activities.
- Rely on interdisciplinary collaboration and turn to specialized resources as required.

GENERAL INFORMATION

- Management must be:
 - pragmatic, symptomatic and personalized;
 - carried out according to usual practices, except in the presence of post-exertional malaises.
- The appearance or exacerbation of psychological symptoms could be the result of the pandemic or post-COVID-19 conditions.

⚠ 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 clinical 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, including psychological symptoms. Consider referring the person to: <ul style="list-style-type: none"> a medical specialist as needed, according to the clinical presentation; support and evaluation services for psychosocial factors, according to usual practices and the structure of services (e.g., Info-Social 811, general social services accessible through a CLSC, community organizations, mental health services portal).

Situational case management


Situations	Management
<p>Clinical manifestations WITH NO post-exertional malaises</p> <p>See the information sheet Altered taste and sense of smell for indications specifically associated with these manifestations.</p> <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>	<ul style="list-style-type: none"> Support the person in managing their symptoms (see the next section). Address manifestations as per the usual practices and monitor the effectiveness of the treatment initiated. Consider the possibility of self-monitoring, depending on the manifestations (e.g., blood pressure). 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> Consider the possible need for home care services, technical aids or mobility aids (e.g., walker with a seat, handicapped parking tag, etc.). 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, cardiovascular or pulmonary condition. <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> a rehabilitation professional or post-COVID-19 clinic¹ if the person presents: <ul style="list-style-type: none"> difficulty managing their energy or their pain that is causing a significant functional disability; significant, persistent respiratory impairment; severe cognitive, cardiac, neurological or musculoskeletal involvement; post-intensive care syndrome.
<p>Clinical manifestations WITH post-exertional malaises</p>	<p>See the management information sheet entitled Post-exertional malaises and fatigue to adapt the management of the clinical manifestations.</p>

1. The service offer is expanding.

MANAGEMENT OF CLINICAL MANIFESTATIONS AND RECOVERY SUPPORT

Situations	Advices
<p>Clinical manifestations WITH NO post-exertional malaises</p> <p>See the management information sheets for details regarding certain manifestations – Altered taste and sense of smell and Cardiorespiratory Manifestations.</p>	<ul style="list-style-type: none"> Provide the usual advices for the management of clinical manifestations. Recall the benefits of good health practices – e.g., rest, proper nutrition, physical activity, stress management, screen time – while verifying the difficulties associated with post-COVID-19 conditions that could constitute obstacles to healthy lifestyle habits. Talk to the person about the importance of having realistic expectations, as the recovery period could be lengthy. <p>⚠ A progressive improvement could be felt up to 12 weeks post-infection for numerous people, but subsequent improvement would tend to be much slower when clinical manifestations are still present.</p> Provide instructions with regard to self-monitoring if necessary (e.g., taking one's blood pressure). Encourage the person to: <ul style="list-style-type: none"> cut back on their commitments and sources of stress; be kind to themselves; normalize their thoughts and emotions regarding the variance between their condition prior to the infection and at the present moment; give themselves permission to ask for help; speak to their loved ones about their symptoms and their effects; obtain psychological support as necessary.
<p>Clinical manifestations WITH post-exertional malaises</p>	<p>See the management information sheet entitled Post-exertional malaises and fatigue for advices adapted to the persons' individual health status.</p>

FOLLOW-UP

Elements	Details
Period between the current and the next visits	<p>If relevant, ask the person to document:</p> <ul style="list-style-type: none"> the signs and symptoms they present (appearance, deterioration and resolution), so as to identify triggers as well as exacerbating and extenuating factors; the significant activities carried out and their energy level; their ability to perform activities of daily living and household tasks, and to attend either work or school. <p>⚠ Some persons whose fatigue is related to post-exertional malaises may tend to prioritize their work and end up collapsing when they return to their home. 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 malaises.</p>
Method – telephone, telemedicine or in person	<ul style="list-style-type: none"> To be determined based on the person's needs. <p>⚠ A personal appointment can require a major effort for some people, and could trigger a post-exertional malaise.</p>
Frequency	<ul style="list-style-type: none"> To be determined based on the person's needs. Consider providing services on a more frequent basis at first or when a modification is brought to the pharmacological treatment (e.g., 1-3 months), then spacing them out thereafter (e.g., 6 months).
Presence of comorbidities	<ul style="list-style-type: none"> Continue doing the usual follow-up.
Follow-up appointment	<ul style="list-style-type: none"> Evaluate the evolution of the clinical manifestations, including those regarding mental state and psychosocial impacts. Follow up on the management of clinical manifestations by the person. Reassess the possible causes of the clinical manifestations. Repeat the tests and investigations as needed, while making sure to not overinvestigate. <p>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.</p>
<p> See the management information sheet Altered taste and sense of smell for recommendations adapted to the persons' individual health status.</p>	