

CARDIORESPIRATORY 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

- Cardiorespiratory manifestations, **frequently** observed in connection with post-COVID-19 conditions, can have a significant impact on a person's functional status.
- Persons hospitalized** during the acute phase are particularly prone to presenting persistent cardiorespiratory manifestations; these manifestations can also impact persons with a less severe initial infection or who are asymptomatic.
- No **prognosis** has been established for cardiorespiratory manifestations, and the recovery period may be lengthy.

CLINICAL MANIFESTATIONS

Cardiorespiratory manifestations of post-COVID-19 conditions¹ (partial list)

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|---|---|
| <ul style="list-style-type: none"> • Arrhythmia • Chest pain or discomfort • Dry or productive cough | <ul style="list-style-type: none"> • Dyspnea² • Orthostatic intolerance • Palpitations |
|---|---|

1. Information is provided in alphabetical order.

2. Most frequently observed manifestation.

- Orthostatic intolerance** consists of a group of symptoms that appear when a person who is lying or sitting gets up (see the table below). These symptoms may or may not be accompanied by orthostatic tachycardia, orthostatic hypotension or syncope.

Symptoms of orthostatic intolerance¹ (partial list)






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| <ul style="list-style-type: none"> • Blurred vision or scotoma • Discomfort while standing up or sitting down • Dizziness or vertigo • Feeling of weakness | <ul style="list-style-type: none"> • Internal tremors - not usually visible outside of the body and often involving the lower limbs • Nausea |
|--|--|

1. Information is provided in alphabetical order.

- ⚠ Orthostatic tachycardia would be observed in a sub-group of people who present persistent symptoms.

- i Instances of postural orthostatic tachycardia syndrome have been reported in the context of post-COVID-19 conditions. The scientific data currently available does not allow for determining whether this is a consequence of the SARS-CoV-2 virus or a condition unrelated to COVID-19. Furthermore, this condition is hard to diagnose and there is no consensus as to how it should best be managed.

ASSESSMENT OF THE HEALTH CONDITION

Elements	Details
Characterize cardiorespiratory manifestations to compare them with the person's baseline status and monitor their evolution.	<ul style="list-style-type: none"> • Type of cardiorespiratory 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. • Effect of changing positions on the symptoms – e.g., appearance or exacerbation while standing, relief or improvement while lying down. <p> An orthostatic intolerance may be suspected if at least one of the symptoms in the previous table is associated with a decrease in the ability to remain standing, but other factors could also be in play and should be investigated (e.g., acute pain, vertigo or a balance disorder).</p>
Look out for possible complications following the acute phase.	<ul style="list-style-type: none"> • Post-infection complications or sequelae. • Sequelae from certain interventions while hospitalized – e.g., orotracheal intubation, tracheotomy.
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 cardiorespiratory manifestations.	<ul style="list-style-type: none"> • See the table on page 3.
Adapt physical and mental exams on the basis of the clinical presentation.	<ul style="list-style-type: none"> • The physical exam could notably include: <ul style="list-style-type: none"> - heart rate and blood pressure; - oxygen saturation at rest and at effort, in the presence of dyspnea or tachypnea; - respiratory rate and pulmonary auscultation. • If an orthostatic intolerance is suspected, attempts to document it could be made (see Appendix I). <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.	<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.	

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

Categories	Examples¹		
Cardiovascular conditions	<ul style="list-style-type: none"> • Aortic aneurysm • Congestive heart failure • Ischemic heart disease 	<ul style="list-style-type: none"> • Myocarditis • Orthostatic hypotension • Pericarditis 	<ul style="list-style-type: none"> • Postural orthostatic tachycardia syndrome • Pulmonary embolism
Respiratory conditions	<ul style="list-style-type: none"> • Asthma • Bronchial hyperactivity • Bronchiectasia • Bronchiolitis • Chronic or acute tracheobronchial infections 	<ul style="list-style-type: none"> • Chronic obstructive pulmonary disease (COPD) • Contracture of the chest muscles • Foreign bodies in the respiratory tract • Hyperventilation syndrome 	<ul style="list-style-type: none"> • Interstitial lung disease • Pleural effusion • Pulmonary fibrosis • Pulmonary hypertension • Respiratory tumours
Gastrointestinal factors	<ul style="list-style-type: none"> • Digestive causes – e.g., dyspepsia with or without gastroesophageal reflux. 		
Physiological factors	<ul style="list-style-type: none"> • Fatigue 	<ul style="list-style-type: none"> • Pregnancy 	
Lifestyle	<ul style="list-style-type: none"> • Consumption of drugs, alcohol, caffeine, etc. 		<ul style="list-style-type: none"> • Active tobacco use.
Treatments (pharmacological or not)	<ul style="list-style-type: none"> • Use of medications – e.g., angiotensin-converting enzyme inhibitors, beta blockers, antidepressants 		<ul style="list-style-type: none"> • Use of natural products
Other factors or conditions	<ul style="list-style-type: none"> • Physical deconditioning 	<ul style="list-style-type: none"> • Psychosocial factors 	<ul style="list-style-type: none"> • Sleep disorders

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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 cardiorespiratory 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 a medical specialist as needed, according to the clinical presentation.
Cardiorespiratory manifestations WITH NO post-exertional malaises	<ul style="list-style-type: none"> Support the person in managing their symptoms (see the next section). Address cardiorespiratory manifestations as per the usual practices and monitor the effectiveness of the treatment initiated. Consider the possibility of self-monitoring of signs and symptoms (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> <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 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> <ul style="list-style-type: none"> a rehabilitation professional or post-COVID-19 clinic¹ in the case of significant persistent impairments that compromise the person's functional ability, among them coughing, abnormal changes to the voice and dysphagia, nutritional issues or respiratory "discomfort" in people with a history of endotracheal intubation or a tracheotomy following hospitalization during the acute phase of COVID-19. <p>📄 See the management information sheet Rehabilitation interventions for information regarding potential support from rehabilitation professionals.</p>
Cardiorespiratory manifestations WITH post-exertional malaises	<p>📄 See the management information sheet entitled Post-exertional malaises and fatigue to adapt the management of the cardiorespiratory manifestations.</p>

1. The service offer is expanding.

MANAGEMENT OF SYMPTOMS AND RECOVERY SUPPORT

Situations	Advices
Cardiorespiratory manifestations WITH NO post-exertional malaises	<ul style="list-style-type: none"> • Provide the usual advices. • For persons who are having difficulty breathing or presenting with symptoms of orthostatic intolerance (see the following table). • For persons with a cough and difficulty evacuating secretions, explain the usual techniques for clearing the airway. • As for resuming physical activity, notify the person that they can gradually resume their physical activities, as tolerated, and begin with low-intensity activities (e.g., walking). <ul style="list-style-type: none"> - Consider referring the person to a medical specialist for special cases – e.g., high-performance athlete. <p> While data on the resumption of activities by persons with cardiorespiratory manifestations are limited, there are no contraindications to doing so prudently.</p> <p> See the management support tool Post-COVID-19 conditions for other general advices.</p>
Cardiorespiratory 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>

Recovery support – Non-pharmacological interventions


Persons with symptoms of orthostatic intolerance

Suggest non-pharmacological measures, based on clinical presentation, for example:

- Remaining properly hydrated and increasing one's salt intake (in the absence of high blood pressure, heart failure or renal failure).
- Avoiding getting up quickly.
- Wearing a support belt or support hose that go up to the waist.
- Sleeping in a bed inclined at a 15-degree angle, head up (reverse Trendelenburg position).
- Avoiding hot environments for prolonged periods (e.g., a hot shower).
- Lying down for at least 15 minutes after a hearty meal or after drinking alcohol.
- Eating smaller meals, in the presence of postprandial hypotension.
- Eating high-protein foods and limiting one's carb intake.

Persons with respiratory difficulties


Suggest breathing exercises, for example:


 A demonstration of the respective breathing exercises could help the person perform these successfully.

Abdominal breathing	Pursed lips breathing	Box breathing
<ul style="list-style-type: none"> • Sit in a comfortable position or lie down on your back. • Place one hand on your chest and the other hand on your abdomen. • Inhale through your nose, deeply and slowly while expanding your abdomen for around 10 seconds. • Hold your breath for around 5 seconds or as tolerated. • Slowly exhale through your nose, while clenching your stomach so as to fully empty your lungs. Repeat this cycle for 5 to 10 minutes every day, as tolerated. You can split up the total time into sessions. 	<ul style="list-style-type: none"> • Sit down in a comfortable position, with shoulders relaxed. • Slowly inhale through your nose, keeping your mouth closed. • Purse your lips as if to whistle. • Slowly exhale through your mouth, while keeping your lips pursed. • Make sure to spend more time exhaling than inhaling. • Repeat this cycle for 5 to 10 minutes every day, as tolerated. 	<ul style="list-style-type: none"> • Sit down in a comfortable position. • Slowly inhale through your nose while counting to 4¹, as tolerated. • Hold your breath while counting to 4, as tolerated. • Slowly exhale through your mouth while counting to 4, as tolerated. • Hold your breath while counting to 4, as tolerated. • Repeat this cycle up to 4 times every day, as tolerated. <p>1. Explain that the rhythm must be regular and that it can be adjusted according to the person's tolerance.</p>

FOLLOW-UP

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

 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.

APPENDIX I

PROCEDURE TO DOCUMENT ORTHOSTATIC INTOLERANCE

➤ The best way to document orthostatic intolerance consists of taking continuous readings. Because this is not always possible, the following procedure can be used to document orthostatic intolerance during a visit. To favour optimal results:

- Use reading devices that do not require any contact between the clinician and the person.
- Whenever possible, choose devices other than the oscillometer and pulse oximeter to measure heart rate.

i The oscillometer and pulse oximeter can return less accurate readings depending on the type of manifestations associated with the orthostatic intolerance, and more specifically in the case of orthostatic tachycardia.

- Verify the heart rate for periods of at least 15 seconds each time.

Procedure to document orthostatic intolerance

Steps	Instructions	To look for
1	<ul style="list-style-type: none"> • Ask the person to lie down. • Take their heart rate and blood pressure 10 minutes and 12 minutes later to ensure that the readings are stable. • Ask the person to describe any symptoms or feelings of discomfort they may be experiencing. 	<ul style="list-style-type: none"> • The person's baseline status: heart rate, blood pressure and symptoms.
2	<ul style="list-style-type: none"> • Ask the person to: <ul style="list-style-type: none"> - stand up; - not move around or overly fidget; - only speak when describing the symptoms or feelings of discomfort they may be experiencing; - relax. • Measure the heart rate and blood pressure once the person is standing, every minute for a period of 10 minutes. <p>i Taking readings during a 10-minute period allows for documenting the orthostatic tachycardia in addition to the orthostatic hypotension.</p> <ul style="list-style-type: none"> • Monitor the person for the appearance of symptoms. <p>⚠ If the person manifests numerous symptoms while standing, make sure a chair or stretcher is close by in case of a malaise. If necessary, perform the exam in the presence of a third party.</p>	<ul style="list-style-type: none"> • At least one of the following parameters: <ul style="list-style-type: none"> - significant drop in blood pressure after changing position; - significant increase in heart rate with no corresponding decrease in blood pressure; - appearance of new symptoms or feelings of discomfort; - exacerbation of symptoms or of feelings of discomfort.
3	<ul style="list-style-type: none"> • Ask the person to: <ul style="list-style-type: none"> - lie down again; - describe the symptoms or feelings of discomfort after 10 minutes. 	<ul style="list-style-type: none"> • Relief from or improvement of the symptoms or feelings of discomfort that appeared or increased in step 2.