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CTS GUIDELINES AND POSITION PAPERS

Addressing therapeutic questions to help Canadian health care professionals optimize COPD management for their patients during the COVID-19 pandemic

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This position statement aims to provide rapid guidance for Canadian health care professionals in treating patients with COPD during the COVID-19 pandemic. A very limited body of published data, inference from indirect data, and recommendations from the guidelines of other international bodies inform these recommendations. As such, these recommendations are primarily based on expert opinion and we recommend that treatment decisions be individualized. As well, these recommendations are subject to change as information regarding COVID-19 and its effects are further understood. We plan to update this guidance as new information becomes available and recommend periodically checking the Canadian Thoracic Society website for updates.

General recommendations for everyone including COPD patients

Patients should stay at home as much as possible, including working from home if feasible. If you must leave the home, we suggest that all patients follow current local, national and global public health advisories with respect to the indications for physical distancing and isolation. Patients should wash their hands with soap and water frequently for 20 seconds or use alcohol-based hand sanitizer containing at least 60% alcohol. Consider having at least a 30-day supply of all medications on hand to reduce the need for leaving the home, select delivery options at your pharmacy or have trusted individuals pick up the medication.

Rationale: Longitudinal experience with seasonal influenza and preliminary data in SARS-CoV-2 infection (see the following sections) suggests that patients with chronic lung disease are at risk for severe complications of SARS-CoV-2 infection (COVID-19). Physical distancing is an important public health measure to "flatten the curve" of community spread of the virus. The workplace is a social environment that may expose patients to others in their community, particularly if physical distancing in the workplace setting is difficult to implement. Until we fully understand the risks associated with SARS-CoV-2 infection in patients with chronic lung disease, we have placed a high value on limiting exposure based on prior experience with influenza.

COPD Management: General Statement

In the absence of direct or indirect data that the use of current inhaled COPD therapies impacts the severity of SARS-CoV-2 infection, ***we recommend that maintenance and exacerbation management for COPD be continued according to current CTS treatment guidelines.***[1,2] ***Based on what we know about viral respiratory infections in patients with COPD, optimal pharmacological treatment is the best way to prevent exacerbations and/or reduce the severity of exacerbations secondary to SARS-CoV-2. Maintenance inhaled therapies have been shown to improve lung function, symptoms, quality of life and decrease the risk of future exacerbations, including those precipitated by viral exacerbations.***

This includes patients using their long-acting bronchodilators (LAMA and/or LABA) and if indicated ICS/LABA combination inhalers. There is no current evidence that inhaled corticosteroids increase the risk of acquiring SARS-CoV-2 infection (COVID-19) or cause complications/worsening of this infection, such as increasing the need for hospitalization, intubation for mechanical ventilation or death.

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Risk of acquiring SARS-CoV-2 infection (COVID 19) in patients with COPD

There DOES NOT appear to be an increased risk for COPD patients to acquire SARS-CoV-2 infection (COVID-19) compared to the general population.

Rationale: Two studies from China and one from Korea did not find that hospitalized patients with COPD were over-represented in the COVID-19 populations studied.[3–5] However, this finding may be subject to change as more reports regarding patient demographics in different countries are published. We will update this document as information becomes available.

Severity of acute exacerbation of COPD caused by SARS-CoV-2 (COVID 19)

We recommend that COPD patients who are diagnosed with a COVID 19 infection continue their inhaled maintenance therapies. It is probable that COPD patients will also experience more severe symptoms of a COVID-19 infection due to their underlying lung disease and that this should be factored into the management plan for the patient.

Rationale: It is probable that COVID-19 can trigger a COPD exacerbation. Viral respiratory tract infections are a common cause of COPD exacerbations.[6] In addition to following public health recommendations, optimizing the outpatient management of COPD (both non-pharmacological and pharmacological) is recommended to reduce the risk of future exacerbations. It should be anticipated that patients with COPD who become infected with COVID-19 are at an increased risk of developing more severe symptoms given their underlying lung disease. A report by Guan et al. indicates that hospitalized patients with COPD were more likely to require ICU support and had higher mortality when compared to other groups.[7] This is further supported by a small meta-analysis by Lippi and Henry suggesting that COPD patients with COVID-19 had over a 5-fold risk of having a severe infection.[8] We suggest careful clinical monitoring of these patients based on their symptoms and response to therapy.

Safety of using systemic corticosteroids (prednisone) to treat acute exacerbations of COPD during the SARS-CoV-2 (COVID 19) pandemic

We suggest using oral prednisone (or other forms of systemic steroids if clinically warranted) to treat Acute Exacerbations of COPD, whether or not the exacerbation is triggered by SARS-CoV-2.

Rationale: There is no direct clinical research to inform an efficacy and safety recommendation.

A) Use of prednisone to treat Acute Exacerbations of COPD **NOT** suspected to be caused by SARS-CoV-2. Prednisone is recommended for the treatment of COPD exacerbations.[1,2] If exacerbations requiring treatment with prednisone are not treated accordingly, patients may require an avoidable emergency department visit or hospitalization (which could also expose them to SARS-CoV-2). There is no available evidence of harm caused by using prednisone to treat COPD exacerbations during the pandemic.

B) Use of prednisone to treat Acute Exacerbations of COPD **suspected** to be caused by SARS-CoV-2. This analysis is relevant to a harm discussion since patients with COPD may receive prednisone for a SARS-CoV-2 triggered exacerbation. There is a concern that prednisone may prolong viral replication.[6] It remains unclear as to whether prednisone is helpful or harmful in the treatment of COVID-19. Most of what we know is coming from studies on SARS-CoV-2 lung injury. Russell and colleagues reviewed observational data and concluded there was no benefit to using prednisone to treat SARS-CoV-2 lung injury.[9] Frontline physicians from the Chinese Thoracic Society challenge this assertion and take the position that since the evidence is inconclusive, and since SARS-CoV-2 lung injury is profoundly inflammatory, that corticosteroids may play an important role. They recommend that physicians should follow basic principles when using corticosteroids: "(1) the benefits and harms should be carefully weighed before using corticosteroids; (2) corticosteroids should be used prudently in critically ill patients with 2019-nCoV pneumonia; (3) for patients with hypoxemia due to underlying diseases or who regularly use corticosteroids for chronic diseases, further use of corticosteroids should be cautious; and (4) the dosage should be low to-moderate (≤0·5–1 mg/kg per day methylprednisolone or equivalent) and the duration should be short (≤7 days)."[10] Arabi and colleagues found that after adjusting for confounders, there was no mortality signal associated with prednisone use in the Middle East Respiratory Syndrome.[11]

In the absence of evidence of harm and an expectation of a low risk of harm, we prioritized the high value of current evidence-based care recommendations to treat COPD exacerbations with prednisone to reduce the need for urgent health service utilization.

Safety of nebulizer use in COPD

We advise against the use of nebulized therapy during this pandemic. We recommend that metered dose inhalers (MDI) with spacing devices, soft mist inhalers or dry powder inhalers be used to administer all COPD medications in all clinical circumstances. This includes at home and inside healthcare facilities including nursing homes. This is to reduce the risk of aerosol spread of the virus particles that could occur with the use of nebulized therapy. Patients who are already using nebulizers to administer therapy at home should continue until such time as their provider can discuss switching to alternative delivery methods and advise on technique. However, they must be made aware of the potential of spread of the virus to others in the household and that they should consider nebulizing their medicines in a separate room from others and implement other infection control recommendations.

Rationale: MDIs with spacing devices are as effective as nebulization and the preferred method of delivery even for

acute exacerbations in the emergency department and hospital, even under non-pandemic circumstances.[12] A dry powder inhaler (terbutaline) or soft mist inhaler (salbutamol/ipratropium bromide) is another alternative. Although the risk associated with nebulization in the context of SARS-CoV-2 is unknown, it is possible that nebulization can increase aerosolization of SARS-CoV-2, as was suggested in a recent simulation study.[13] This may increase the risk of infection for healthcare workers and caregivers.

We placed a high value on selecting an effective method of delivery of inhaled medications while reducing any potential risk of disease transmission. If switching from nebulized to MDI for short acting reliever agents, a conversion table is provided as follows:

Reminder:	*Approx. Equivalent Nebule vs puffers (MDI)*	
Salbutamol	*1 Nebule (2.5 mg / neb)*	*4 puffs (100 mcg/puff)*
Ipratropium	*1 Nebule (500 mcg/neb)*	*4-8 puffs (20 mcg/puff)*

Self-management education, pulmonary rehabilitation and exercise for patients with COPD

During this pandemic, self-management education and pulmonary rehabilitation in-person programs will be closed until further notice. Self-management and pulmonary rehabilitation counseling can still be done remotely by telephone or via tele-health technologies in some institutions. This is also an opportune time to review existing COPD Action Plans or discuss the development of an action plan for your patient to limit the need for the patient to leave the home.

Although rehabilitation programs may be closed, this does not mean that the patient should remain inactive during this period of the COVID-19 pandemic or that they should not continue to implement their self-management strategies at home. Recommendations for patients are to continue to:

1. adhere to their treatment plan (regular medication and action plan with additional treatment in the event of an exacerbation); and
2. practice a healthy lifestyle including remaining physically active. An example of this includes going for daily walks while practicing physical distancing of at least 2 meters from others, and using functional resistance exercises for strength training at home.

A **free** online learning self-management education course including resources from the Canadian Pulmonary Rehabilitation Program is available at www.livingwellwithcopd.com. Health care professionals will need to create an account (free) to access the information and clinical tools. Once logged in, visit the tab "Learning Activities" for a series of videos that cover all aspects of the "Living Well with COPD" program, called the "online course", and the "Rehabilitation" tab which will provide you tools for running a pulmonary rehabilitation program including education materials and exercise videos. All content is available in English and French. Patients can access exercise videos at https://cts-sct.ca/covid-19/covid-19-copd/ or by creating a free account on www.livingwellwithcopd.com to access the full online course under the "Learning Activities" tab and a variety of educational materials under the "Documentation and Tools" section.

The **CTS COVID-19 webpage provides links to various online resources** that can help facilitate the teaching and implementation of self-management and rehabilitation strategies.

Home oxygen use for patients with COPD

Patients who currently are on oxygen should continue to use their oxygen as prescribed. They should clean their equipment, including their hosing, routinely and follow the manufacturer's instructions for cleaning and maintenance. If the patient has had to increase their flow rates of their home oxygen, the patient should inform the physician, and/or case-manager, and/or if in extreme distress, call 911.

We will review our recommendations at least every two weeks and as more information becomes available

The pandemic is a rapidly evolving situation. Health care professionals are advised to look to the Canadian Thoracic Society website for additional COPD resources (action plans and tutorial videos for adults for the proper use of inhalers, etc.), as well as further updates on COVID-19 and lung diseases.

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