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lung health foundation

Lung Health Foundation
18 Wynford Drive, Suite 401, Toronto, ON M3C 0K8
T 1-416-864-9911 | **F** 416-864-9916 | **E** info@lunghealth.ca | lunghealth.ca
Lung Health Line: 1-888-344-LUNG (5864)

From: The Lung Health Foundation (LHF) and the Primary Care Asthma Program (PCAP)
Date: November 9, 2020
Re: **Recommendations for Conducting Spirometry Testing and Nebulized Treatment in Primary Care during the COVID-19 Pandemic**

To Ontario's Primary Care Providers,

The Lung Health Foundation remains dedicated to helping all Canadians breathe, and appreciates the long-standing partnership that exists with the Ontario Ministry of Health (MOH) in delivering an integrated model of care for asthma and COPD patients in Ontario. The Primary Care Asthma Program (PCAP) is an evidence-based asthma and COPD program intended to provide primary care providers with decision aids to support best practice regarding asthma and COPD assessment, diagnosis and management. Its development, implementation and evaluation are funded through Ontario's Ministry of Health, as one of the initiatives of the Ontario Asthma and COPD Program. We have, and will continue to help Ontarians effectively manage their asthma and COPD through the delivery of services and programs.

The Lung Health Foundation, together with its Primary Care Asthma Program (PCAP), is dedicated to supporting safe, evidence-based respiratory practices in primary care across Canada. With the emergence of COVID-19 (SARS CoV-2), a novel infectious respiratory disease, there has been a growing need for guidance on respiratory practices required to manage asthma, COPD and other chronic lung diseases. Here we provide comments on, and recommendations for the provision of spirometry testing and nebulized treatments in Ontario. In both cases, as for most issues relating to COVID-19, specific evidence is sparse and emerging rapidly. We have therefore drawn on limited relevant research, recommendations from experts and experience in other jurisdictions, pre-existing evidence regarding similar respiratory viruses, and general precautionary principles available as of the date of these recommendations.

Spirometry Testing

The ability to carry out spirometry, a key diagnostic test for asthma and COPD, has been halted across Ontario because of the concern around COVID-19 transmission and risk to health providers performing these tests. Spirometry is an essential objective test that is used together with history and physical assessment to diagnose COPD and asthma, determine therapeutic response, and also to assess preoperative risk. The Ministry has amended Directive #2 for Health Care Providers to allow resumption of deferred services. Given the importance of spirometry testing, and recognizing, in particular, that asymptomatic individuals can be infectious, the provision of guidelines for the safe resumption of spirometry is imperative.

To date, we know that transmission of COVID-19 may occur following contact with infected droplets, including exposure to a cough or sneeze[1]. An April 10, 2020, Public Health Ontario (PHO) document on coughs states that, while a cough or a sneeze may generate aerosols, procedures that may cause a cough or a sneeze are not classified as aerosol generating medical procedure (AGMPs)[2]. Rather, an AGMP is a medical procedure in which the aerosols generated enable airborne transmission of the infectious agent[2]. For AGMPs, N95 respirators and eye protection are required. Currently spirometry testing is not listed as an AGMP. However, spirometry frequently induces *forceful* coughing, which may create conditions for aerosol generation.[3] This potential for aerosol generation, combined with the prolonged and close physical contact required to conduct spirometry, may increase the potential for COVID-19 transmission to the health care provider. Therefore, there remains an important question regarding what level of personal protective equipment (PPE) the health care provider should be wearing when carrying out spirometry testing in order to minimize transmission risk. Also whether considerations need to be given to air filtration and/or time between patients.

The Canadian Thoracic Society (CTS) and the Canadian Society of Respiratory Therapists (CSRT) has released a joint statement on July 12, 2020. In it, they acknowledge that some PFTs are more likely to induce cough than others and out of an abundance of caution, all PFTs should be treated as an AGMP and precautions be taken accordingly[4]. The American Thoracic Society (ATS) has also published a statement on AGMPs where they state that COVID-19 may be transmitted by contact, droplet and aerosol[5]. Currently there is no objective evidence confirming that COVID-19 is transmitted by aerosol. Until there is evidence that COVID-19 is transmitted by aerosol or spirometry is considered an AGMP, the Lung Health Foundation and PCAP recommends the use of eye protection, gloves, isolation gown and surgical masks with spirometry testing. Although this guidance document supports most of the recommendations of CTS, ATS and ERS, it disagrees with the assumption that coughing during spirometry testing should be considered equivalent to an AGMP. This is based on the current recommendations widely adopted regarding the precautions in managing COVID-19 positive patients in hospital wards and Emergency Departments. In these settings, known COVID-19 positive patients who are actively coughing are being managed as per droplet precautions. Health care providers managing these patients have not been infected at a higher rate as would have been expected if coughing was equivalent to an AGMP. Public Health Ontario released updated IPAC recommendations for use of personal protective equipment for care of individuals with suspect or confirmed COVID-19 on July 27 2020. Spirometry is not listed as an AGMP in these recommendations.

The CTS/CSRT and ERS documents align well with the recent Ministry of Health COVID-19 Operational Requirements: Health Sector Restart document released May 26, 2020 and updated June 15, 2020. They separate recommendations into a "Pandemic Phase" in which there is high community prevalence of COVID, and a "Post-peak phase" where there is low community prevalence. However, the recommendations are the same for both phases, and so we have provided a single list of recommendations. The key issue they considered was whether PPE use should change during a low prevalence phase. Without further evidence and ensuring safety of patients and staff, they (and we) recommend the continued use of full PPE (mask, gown, gloves, face shield or goggles) in the post-peak phase. Local Public Health guidance will indicate when it is appropriate to move to the post pandemic phase. We provide their recommendations here, with some minor changes.

Spirometry Testing Recommendations:

- Implementation of a pre-screening process (assessing for low or high-risk patient and low or high-risk community) is required. This should occur within 72 hours of the scheduled test and upon entrance to the site on the day of testing.

- During high community prevalence, testing should be limited to urgent/essential tests only for immediate diagnostics of current illness (e.g., time-sensitive and critical for clinical decision-making such as suspected lung transplant rejection).

- For patients deemed a high-risk or from a high-risk community, testing should not be performed in the primary care setting.

- Delay testing on patients who are suspected to have or have tested positive for COVID-19 until after they are considered recovered as per provincial guidelines.

- Delay testing on patients who are suspected to have influenza or other upper respiratory tract infection until they have recovered.

- Ensure physical distancing in the waiting areas/patient seating areas (at least 2m). Staggered appointment times may be appropriate to limit the number of patients in waiting areas. This will depend on the number of other staff on site who are concurrently seeing patients. Staff work stations should also follow physical distancing rules. One-way patient flow should be implemented to minimize contact with individuals.

- History taking and communication of results and/or further counselling should take place in a room separate from that used for testing or performed remotely before the patient arrives and when the patient has left the facility respectively.

- Proper hand hygiene before and after testing for both the patient and the provider is required

- Patients should be tested in designated testing rooms

- Consider tubing/cable length to ensure physical distancing rules are followed (at least 2m between the patient and the healthcare provider).

- For bronchodilator responsiveness testing, patients should be encouraged to bring their own reliever inhaler (e.g., salbutamol) and spacing device. If the patient does not have a reliever inhaler or does not remember to bring their inhaler, the site should provide a new salbutamol MDI (one-time use) and a spacing device (one-time use) or follow their local public health guidelines on cleaning MDI and canisters between patients.

- Sufficient time should be allowed for testing and for cleaning/decontamination of all surfaces and test equipment between patients with an appropriate disinfectant, and for proper PPE donning and doffing. Time should also be taken to recalibrate lung function equipment after decontamination to maintain accuracy of equipment. Overall, it is recommended that additional time be scheduled for each test to allow for the appropriate measures to be taken to ensure safety.

- Organizations advocating AGMP precautions suggest that if feasible, HEPA filtration systems with UV germinal lamps should be used in the room where testing occurs[6]. For most primary care sites, the cost of these systems is prohibitive. PHO and the Ontario Chief Medical Officer of Health (CMOH) position is that spirometry is not categorized as an AGMP. For PHO guidance on HEPA filtration and the adequate number of air exchanges for airborne conditions can be found here.

- Rooms should be ventilated post testing by opening doors and windows (if possible). Sites may decide to measure the air exchange rate in each room used for testing. Recommendations vary regarding how much time should elapse between test termination and subsequent testing, from 15 minutes to 3 hours. CTS recommends 3 hours where a room has less than 6 air exchanges per hour or the rate of air exchange is unknown. This reflects the assumption that coughing during spirometry is an AGMP. PHO and the Ontario CMOH position is that spirometry is not an AGMP and the CTS recommendations go above and beyond precautions that PHO and the CMOH would recommend for spirometry testing.

- Testing should be carried out with in-line bacterial/viral filters. Spirometers that do not have the capability of adding an in-line filter should not be used at this time.

- With regards to PPE, we are recommending that all staff should be wearing at minimum a surgical mask, gown, gloves and face shield or goggles. Evidence to this can be found in the PHO document on coughs.[2] The categorization of spirometry as an AGMP does not align with PHO and the Ontario CMOH position on this and therefore, taking droplet/contact precautions are appropriate. Organizations that have considered spirometry an AGMP have advocated for the use of N95 (fit tested) masks and may choose to implement these precautions

- Patients should also be provided with face/surgical masks or asked to bring their own face coverings, to be worn at each point when active testing is not being carried out.

- When planning to restart testing in your community, work with your local public health authority to determine prevalence in your area (low-risk or high-risk community). All staff should be trained regarding the approved comprehensive plan to prevent another infection outbreak.

Recommendations for Nebulized Inhaled Treatments

There is also a growing need in home and community care for guidelines on precautions that should be taken for patients on nebulized inhaled treatments (this document does not address in-hospital settings). Nebulized treatments are given for acute asthma or COPD exacerbations in long term care facilities and individual homes. It has been established that nebulization of medication may increase the risk of spreading COVID-19 through aerosolization[7]. Though PHO states there is inconclusive evidence documenting transmission via nebulized therapies[8] a risk assessment should be conducted with regards to the therapy being categorized as an AGMP. Regarding nebulized therapies inside a long term care facility and an individual home, we endorse the Canadian Thoracic Society (CTS) position statement from the Asthma Clinical Assembly that recommends nebulized therapies should be replaced by metered dose inhalers (MDI) or dry powder inhalers (DPI) to administer short acting bronchodilators and inhaled corticosteroids inside health care facilities (including nursing homes) to reduce the risk of aerosol spread of virus particles[9]. For home settings, we recommend the direction advocated by the CTS. It recommends that the nebulized treatment should be provided in a separate room, away from other family members[10]. For health care providers working in the community, full PPE should be worn (N95 mask, face shield, gown, gloves) when treating and providing care for a patient requiring nebulized inhaled treatment. The Ontario Chief Medical Officer of Health regards the recommendation to use an N95 mask in the above circumstance as reasonable at this time.

These recommendations are based on the best available evidence to date. These recommendations are subject to change as new evidence emerges.

Sincerely,

Itamar E. Tamari, MD CCFP FCFP
Medical Director and Co-Chair, PCAP
Family Physician, Stonegate CHC

George Habib
President and CEO,
Lung Health Foundation

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