

Primary Care Asthma Program

lungontario.ca/clinical-practice-education/publications

A newsletter for all health care professionals in primary care in Ontario
Winter 2020

Managing childhood asthma: tips and tools



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Diagnosing asthma

Managing childhood asthma begins with the early recognition of symptoms and making a confirmed diagnosis. Asthma can be diagnosed in children 6 years and older in the setting of compatible symptoms and confirmatory pulmonary function testing (i.e. spirometry that shows reversible airflow obstruction, or positive methacholine test). However, pulmonary function testing is not readily available for children 1-5 years old making asthma diagnosis in this age group more challenging. In preschoolers, confirmation of asthma relies on a therapeutic trial of asthma medication with careful documentation of response. As published in the joint Canadian Thoracic Society and Canadian Paediatric Society position paper, "Diagnosis and management of asthma in preschoolers¹", (<https://cts-sct.ca/guideline-library/>) the specific steps for making a diagnosis of asthma in this age group requires the trained health care provider to perform the following (in the absence of evidence for an alternative clinical diagnosis):

1. Document wheeze and other signs of airflow obstruction through direct observation or convincing parental report;
2. Document (i) directly observed improvement in signs of airflow obstruction with short acting beta agonist (SABA) +/- oral corticosteroids, or (ii) convincing parental report of a symptomatic response to a 3-month trial of a medium dose of inhaled corticosteroid (ICS) with as-needed SABA, or SABA alone.

Treating asthma in children under age 6 years

Following a diagnosis of asthma, indications for daily controller therapy in preschoolers have a lower threshold compared to older age groups. This includes one or more exacerbations requiring systemic corticosteroids per year or the presence of persistent symptoms (>8 days/month) between exacerbations.

The first line treatment for preschoolers with poorly controlled asthma is a daily low dose inhaled corticosteroid plus a short acting beta agonist (SABA) as needed, via metered dose inhaler and valved holding chamber. Daily montelukast is an alternative², albeit less effective as a first line treatment option.

If symptoms remain poorly controlled within a 3 month period despite a careful confirmation of diagnosis, assessment of daily adherence to medication and proper device technique, reinforcement of trigger avoidance and search for comorbid conditions, then inhaled corticosteroids should be escalated to a medium dose. It is important to note that categories of low, medium and high dose inhaled corticosteroids in preschoolers are much lower than in older children and adults, the correct dosage should be checked prior to prescription. (Table 1)

Table 1. Dosing categories for inhaled corticosteroids in children

Corticosteroid (generic name)	Daily ICS dose (ug/day)			
	Age 1-5 years		Age 6-11 years	
	Low	Medium	Low	Medium
Beclomethasone dipropionate HFA	100	200	≤200	201-400
Ciclesonide	100	200	≤200	201-400
Fluticasone	100-125	200-250	≤200	201-400
Budesonide			≤400	401-800

Adapted from Diagnosis and Management of Asthma in Preschoolers 2015¹ and Canadian Thoracic Society 2012 Guideline update: Diagnosis and Management of Asthma in Preschoolers, Children and Adults³

Beclomethasone dipropionate HFA is approved for children ≥ 5 years old. Ciclesonide is not approved for this age group by Health Canada. Daily doses of beclomethasone dipropionate HFA >200 mcg/day and ciclesonide >200 mcg/day are not approved for use in children by Health Canada (highlighted)

Asthma control (Table 2) should be assessed regularly in preschoolers and a step-down in dose or discontinuation of controller medications may be considered if there have been minimal symptoms and no significant exacerbations in the previous 3-6 months.

Treating asthma in children 6 years and older

Developing an asthma treatment plan and determining if daily controller therapy is warranted in older children requires a formal assessment of asthma control (Table 2)

Table 2. Assessing asthma control in children

Daytime symptoms	<4 days per week
Night time symptoms	<1 night per week
SABA use	< 4 times per week
Exacerbations (requiring systemic steroids or hospitalization)	≤1 per year
Ability to participate in physical activity	Normal
Absences from (pre) school or child care	None

Adapted from Canadian Thoracic Society 2012 Guideline update: Diagnosis and Management of Asthma in Preschoolers, Children and Adults³

The approach to treatment of children 6 years and older with poorly controlled asthma is similar to that in the preschool age group. It is important to note that recommended ranges for low and medium dose inhaled corticosteroids differ (Table 1). If symptoms remain poorly controlled in this age group despite adherence to a daily medium dose of inhaled corticosteroids, then a further step up in asthma therapy with addition of montelukast may be warranted. ICS/LABA medications may also be used off-label for children below 12 years of age under specialist care.

For all children 1-11 years of age, it is important to recognize when to refer to an asthma specialist. Indications for referral include asthma that is sub-optimally controlled despite a medium dose of daily inhaled corticosteroids, suspicion of an alternative diagnosis or for those who require specialized testing (e.g., allergy skin prick testing).

Side effects of asthma treatments

The most important side effects of low to medium dose inhaled corticosteroid treatment for children include the development of oropharyngeal thrush (which can be mitigated by rinsing the mouth or brushing the teeth after each administration) and a potential reduction in growth velocity and final decrease in adult height of 1cm on average⁴. Adrenal suppression is not generally a concern for children on low to medium dose inhaled corticosteroids, but it is an important side effect to be aware of for children who additionally receive multiple courses of systemic corticosteroids. Montelukast can be associated with neuropsychiatric side effects and families should be cautioned to watch for this.⁵

Asthma education and Asthma action plans

Every child diagnosed with asthma should be provided comprehensive asthma education by a certified respiratory educator (CRE). Education includes counselling on the importance of identifying and avoiding triggers, medication device technique, importance of adherence to asthma controller medications, and how to manage escalation of symptoms using an asthma action plan. Though there are multiple available asthma action plans in Canada, evidence has shown these are highly variable and may not conform to guidelines. In response to this, the Lung Association rigorously developed a new asthma action plan for use in the ambulatory care setting for children 1-15 years of age with content that reflects the most recent evidence for childhood asthma management (figure 1).

Figure 1. The Ontario Lung Association’s Pediatric Asthma Action Plan

Pediatric Asthma Action Plan (1-15years)

BREATHE
the lung association

Always remain on your green zone medication, even if you are having no symptoms of asthma.

NAME: _____ DATE: _____
HEALTHCARE PROVIDER: _____ PHONE: _____
Review your action plan with your healthcare provider at every visit.

GO: Maintain Therapy	CAUTION: Step Up Therapy	STOP: Get Help Now																									
<p>DESCRIPTION</p> <p>You/your child has ALL of the following:</p> <ul style="list-style-type: none"> • Use of reliever puffer no more than 3 times a week* • Daytime symptoms (cough, wheeze or breathing problems) no more than 3 times a week* • Ability to do physical activity (playing, running, or sports) without difficulty • No nighttime asthma symptoms • Not missing regular activities or school • No symptoms of a cold <p>*1 time a week if 1 to 5 years old.</p>  <p>Other: _____</p>	<p>DESCRIPTION</p> <p>You/your child has ANY of the following:</p> <ul style="list-style-type: none"> • Use your reliever puffer more than 3 times a week* • Daytime symptoms (cough, wheeze or breathing problems) more than 3 times per week* • Difficulty with physical activity (playing, running) or sports • Asthma symptoms for 1 or more nights a week • Missing regular activities or school • Symptoms of a cold <p>*1 time a week if 1 to 5 years old.</p>  <p>Other: _____</p>	<p>DESCRIPTION</p> <p>You/your child has ANY of the following:</p> <ul style="list-style-type: none"> • Reliever puffer lasts less than 3 hours • “Pulling in” of skin in the neck/between or below ribs • Feeling very short of breath • Difficulty talking • Continuous wheeze or cough  <p>Other: _____</p>																									
<p>INSTRUCTIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #00b050; color: white;">MEDICATION</th> <th style="background-color: #00b050; color: white;">PUFFER COLOUR</th> <th style="background-color: #00b050; color: white;">DOSE</th> <th style="background-color: #00b050; color: white;">PUFFS</th> <th style="background-color: #00b050; color: white;">TIMES A DAY</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="background-color: #00b050; color: white;">CONTROLLER</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td colspan="5" style="background-color: #00b050; color: white;">RELIEVER</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td>every 4 hrs as needed</td> </tr> </tbody> </table> <p><input type="checkbox"/> Use reliever before exercise</p> <p>Other: _____</p>	MEDICATION	PUFFER COLOUR	DOSE	PUFFS	TIMES A DAY	CONTROLLER										RELIEVER									every 4 hrs as needed	<p>INSTRUCTIONS</p> <p><input type="checkbox"/> Take _____ reliever _____ puffs (colour) every 4 hours as needed, and:</p> <p><input type="checkbox"/> Continue to take your green zone medication</p> <p><input type="checkbox"/> If reliever puffer is needed consistently every 4 hours, or if there is no improvement in your symptoms in 2-3 days, contact your healthcare provider</p> <p>Other: _____</p>	<p>INSTRUCTIONS</p> <p>Take _____ reliever 4-6 puffs every 15-20 minutes, and (colour) Call 911 or go directly to the emergency department</p> <p>Asthma symptoms can get worse quickly Asthma can be a life-threatening illness - DO NOT WAIT!</p> <p>Bring this asthma action plan with you to the emergency department Stay calm</p> <p>Other: _____</p>
MEDICATION	PUFFER COLOUR	DOSE	PUFFS	TIMES A DAY																							
CONTROLLER																											
RELIEVER																											
				every 4 hrs as needed																							

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Use a spacer device (holding chamber) with all metered dose inhalers.

Lung Health Line 1-888-344-LUNG (5864) or lungontario.ca

Summary

Management of childhood asthma first requires objective diagnosis through identification of compatible symptoms and confirmation with pulmonary function testing. In preschoolers, diagnosis can be made through careful documentation of signs and/or symptoms of airflow obstruction, reversibility of symptoms, and no clinical suspicion of an alternative diagnosis. The treatment of children with poorly controlled symptoms includes early initiation of a daily low dose inhaled corticosteroid, coupled with self-management education and a personalized asthma action plan.

References

1. Ducharme FM, Dell SD, Radhakrishnan D, et al. Diagnosis and management of asthma in preschoolers: A Canadian Thoracic Society and Canadian Paediatric Society position paper. Canadian respiratory journal : journal of the Canadian Thoracic Society 2015;22:135-43.
2. Szeffler SJ, Baker JW, Uryniak T, Goldman M, Silkoff PE. Comparative study of budesonide inhalation suspension and montelukast in young children with mild persistent asthma. The Journal of allergy and clinical immunology 2007;120:1043-50.
3. Lougheed MD, Lemiere C, Ducharme FM, et al. Canadian Thoracic Society 2012 guideline update: diagnosis and management of asthma in preschoolers, children and adults. Canadian respiratory journal : journal of the Canadian Thoracic Society 2012;19:127-64.
4. Zhang L, Pruteanu AI, Prietsch SO, Chauhan BF, Ducharme FM. Cochrane in context: Inhaled corticosteroids in children with persistent asthma: effects on growth and dose-response effects on growth. Evid Based Child Health 2014;9:1047-51.
5. Glockler-Lauf SD, Finkelstein Y, Zhu J, Feldman LY, To T. Montelukast and Neuropsychiatric Events in Children with Asthma: A Nested Case-Control Study. The Journal of pediatrics 2019;209:176-82 e4.

Influenza Infection and Benefits of Influenza Vaccination among People with Chronic Obstructive Pulmonary Disease (COPD)



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On Behalf of the Canadian Immunization Research & Serious Outcomes Surveillance Network

How Common is Influenza Infection in Canada?

The fall season usually marks the start of 'Influenza Season' in Canada. During the months of October to April, the influenza virus is a common cause for respiratory illness among Canadians. Over the 2018-2019 influenza season there were 39,192 cases of influenza infection, and each year the Public Health Agency of Canada estimates 12,200 hospitalizations and 3500 deaths due to influenza and its related health complications (1).

Transmission, Symptoms, and Complications from Influenza

The influenza virus is generally spread by small respiratory droplets which are produced when people with influenza infection cough or sneeze (2,3). The most common symptoms of infection include high fever, cough, and muscle aches, but people with chronic lung or heart disease often experience an exacerbation of their underlying condition (COPD exacerbation or heart failure) (4). Among people with COPD, the most common complications of influenza infection are bacterial pneumonia and COPD exacerbation, both of which carry a high morbidity and mortality rates in elderly individuals (5).

How Serious is Influenza Infection among People with Chronic Lung Disease?

A recent study published by the Canadian Immunization Research Network identified that 1 in 3 Canadians with COPD who presented to hospital with respiratory symptoms tested positive for the influenza virus (6). Further, people with COPD and influenza infection experienced higher rates of death (9.7% vs 7.9%) and need for intensive care (17.2% vs 12.1%) compared to people without influenza (6). Several factors including, age >75 years, heart disease, residing in long term care, and use of home oxygen were associated with a greater chance of death among people with COPD and influenza infection (6). The results of this study underscore the importance of testing (with a nasopharyngeal swab) and empirically treating influenza (antiviral therapy) among people with COPD who present to hospital with respiratory symptoms.

How can we prevent influenza transmission & infection?

There are two main strategies to prevent or mitigate the transmission of influenza virus.

First, Canada's national organization for infection prevention and control (IPAC Canada) recommends good hand hygiene practices after contact with the mouth/nose or respiratory secretions, covering any coughs and sneezes, and avoiding close contact with ill persons (including avoiding handling soiled tissues used by an ill person) (7).

Second, influenza vaccination remains the strongest and best available preventative strategy against influenza infection and transmission (8). The National Advisory Committee on Immunization in Canada (NACI) recommends influenza vaccination for anyone over the age of 6 months, with a heightened focus on high risk groups such as those with chronic lung disease (COPD) (8). Vaccination is also recommended for individuals who are at high risk of **transmitting** influenza infection to a vulnerable person (such as a household contact or caregiver of an individual with COPD, or health care workers) (7,8).

What are the Benefits of Vaccination among people with COPD?

Receiving an influenza vaccine is associated with reduced influenza-related exacerbations, acute respiratory infections, and hospitalizations among people with COPD (6). A recent Canadian study among hospitalized people with COPD over four influenza seasons found that vaccination significantly reduced hospitalizations by 38% (6). Despite the clear benefits, the vaccination rate among people with COPD in Canada is sub-optimal (6,9). While the reasons for this aren't entirely clear, improving the access to vaccination for people with chronic lung disease, and educating people and their care givers about the severe consequences of influenza infection may help to improve the vaccination rates.

A Final Note...

Among people living with chronic lung disease, influenza infection is a common reason for hospitalization during the winter season, is associated with serious adverse health events, and can be prevented with seasonal vaccination each fall. Lung health providers should advocate for influenza vaccination to take place during clinical encounters, and should always consider influenza infection as a potential cause for any respiratory illness during the winter season.

References

1. FluWatch Surveillance Canada. 2019 [cited 2019 Sep 17]. Available from: <https://www.canada.ca/en/public-health/services/diseases/flu-influenza/influenza-surveillance/weekly-influenza-reports.html>
2. Brankston G, Gitterman L, Hirji Z, Lemieux C, Gardam M. Transmission of influenza A in human beings. *Lancet Infect Dis.* 2007 Apr;7(4):257–65. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17376383>
3. Killingley B, Nguyen-Van-Tam J. Routes of influenza transmission. *Influenza Other Respi Viruse.* 2013 Sep;7 Suppl 2:42–51. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24034483>
4. Mallia P, Johnston SL. Influenza infection and COPD. *Int J Chron Obstruct Pulmon Dis.* 2007;2(1):55–64. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18044066>
5. Rothberg MB, Haessler SD, Brown RB. Complications of viral influenza. *Am J Med.* 2008 Apr;121(4):258–64. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18374680>
6. Mulpuru S, Li L, Ye L, Hachette T, Andrew MK, Ambrose A, et al. Effectiveness of Influenza Vaccination on Hospitalizations and Risk Factors for Severe Outcomes in Hospitalized Patients With COPD. *Chest.* 2019 Jan;155(1):69–78. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/30616737>

7. Infection Prevention and Control Canada. [cited 2019 Sep 17]. Available from: <https://ipac-canada.org/influenza-resources.php>
 8. National Advisory Committee on Immunization (NACI): Canadian Immunization Guide Chapter on Influenza and Statement on Seasonal Influenza Vaccine for 2018-2019. Public Health Agency of Canada, May 2018. [cited 2019 Sep 17] Available from: <https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-statement-seasonal-influenza-vaccine-2018-2019.html>
 9. Vozoris NT, Loughheed MD. Influenza vaccination among Canadians with chronic respiratory disease. *Respir Med.* 2009 Jan;103(1):50–8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18818066>
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Sharepoint Spirometry Interpretation Portal: A Champlain LHIN Initiative

By Christina Dolgowicz, RRT/CRE, PCAP Coordinator, Lanark Renfrew Health & Community Services

In 2014, the Champlain Local Health Integration Network (CHLHIN) made new investments into existing primary care asthma program (PCAP) sites to implement and expand community COPD services including COPD education and community-based pulmonary rehabilitation programs. Within a short time of rolling out the programs, it was obvious that access to spirometry or pulmonary function testing in the rural setting was limited, if available at all. Many clients referred to rural community lung health programs had no objective diagnosis of lung disease but instead their diagnosis was solely based on smoking history and symptoms. The 2008 Canadian Thoracic Society Guidelines for COPD state that 'post-bronchodilator spirometry is required to evaluate the presence and severity of airway obstruction' (1). Knowing objective testing is the first step in diagnosing COPD and access to the testing was limited, the Lanark Renfrew Community Lung Health Program initiated a pilot project and brought spirometry testing to these under serviced rural communities.

Performing spirometry is one of the main components of PCAP, and therefore the staff (Registered Respiratory Therapists/Certified Respiratory Educators) had the skills and knowledge to perform pre and post spirometry for diagnostic purposes. The challenge was to find a process for interpretation. Previous methods for interpretation included: leaving spirometry for provider to interpret, faxing spirometry to internist, and providing paper copies for respirologists to interpret while on site. Previous methods resulted in lengthy delays with interpretation, increased administrative demand and the challenge of tracking those spirometry tests and finally, inconsistency with interpretation. With the assistance and leadership for the Champlain LHIN, Lanark was able to utilize an existing SharePoint platform to develop a spirometry interpretation site. This site allowed tests to be interpreted remotely by a respirologist with interpreted results automatically being sent back to the primary care provider. This secure website is maintained by the Champlain LHIN.

Interpretation Form:

It was important that interpretation was clear and consistent. Necessary components included: name, date of birth, primary care provider and fax number. This information was retrieved from the completed spirometry.

CHAMPLAIN Lung Health Community Lung Health Programs in Champlain Ontario

SPIROMETRY INTERPRETATION

Client Name: First Name: _____ Last Name: _____

Date of Birth: _____

Choose PCP from one of the dropdown lists. PCP Name: _____ PCP Name from DCO ref list: _____

PCP Fax #: _____

Respirologist: _____ Assigned Date (autofilled): _____

Breathing Test: [Click here to attach a file](#) **SUBMIT TO RESPIROLOGIST**

Respirologist:

To maintain consistency with CTS guidelines in spirometry interpretation, a standardized template was created to include the degree of obstruction and diagnosis.

RESPIROLOGIST SECTION

Interpretations

Normal Mild (FEV1 >=80%)

Restrictive Moderate (50% <+FEV1 <80%)

Obstructive Severe (30% <=FEV1 <50%)

Mixed Very Severe (FEV1 <30%)

Diagnosis

COPD Asthma

Further investigation required Normal

Comments: _____

Please check that you authorize the above interpretation:

Authorized By: _____ **SUBMIT INTERPRETATION**

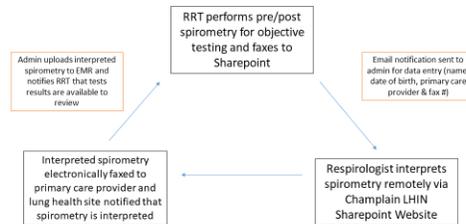
Office use only

Completed Date: _____ Status: PENDING

How Does this Work?

Once spirometry is completed, the RRT faxes spirometry results to the Sharepoint Interpretation website. This is completed either electronically through the electronic medical record (EMR) or by paper. Once received, the website generates an email which is sent to the administrative assistant in Lanark notifying them a spirometry is waiting to be triaged. The administrative assistant logs into the Sharepoint website, attaches the spirometry (PDF) to the interpretation form and enters the client’s name, date of birth, primary care provider and fax number (from a drop down list) and assigns a respirologist (also from a drop down list) and submits the interpretation form. This results in the respirologist receiving an email notification that a new spirometry is waiting to be interpreted. The respirologist then logs onto the website, reviews the spirometry, completes the interpretation template and submits. Upon submission, the referring

primary care provider receives a fax that includes the interpretation form along with the flow volume loops. The Lanark Renfrew Lung Health Program receives an email that spirometry has been interpreted and the administrative assistant imports the interpretation results into the EMR and notifies the responsible RRT.



Pilot:

The pilot began in July 2018 with one respiratory therapist and a family health team from Barry's Bay. Providers were instructed to use the 'Canadian Lung Health Test' to determine whether a spirometry referral was warranted. Within six months, eighty-five spirometry tests were interpreted via the Sharepoint site. Feedback from providers at six months included:

"it is easy to access"

"Turn around time is relatively quick"

"Reputable interpretations from a respirologist. Fairly quick to receive back"

In February 2018, the pilot was rolled out to include all other lung health sites (14 across 4 counties) and 359 spirometry tests have been completed to date with approximately 29% of spirometry tests interpreted as COPD.

For more information on the Sharepoint Interpretation Site, please contact: Christina Dolgowicz cdolgowicz@lrhcs.ca

A special thank you to Leah Bartlett and Mary Windsor at the Champlain LHIN for making this project possible.

Reference:

1. O'Donnell, D et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease -2008 update – highlights for primary care. Can Respir J Vol 15. 1A-8A.

RRT's Leading Innovation and Health System Transformation: Best Care Program

By: Melissa Fisk RRT/CRE/RPSGT, Zofe Roberts RRT/CRE, Madonna Ferrone RRT/CRE

After years of hard work and dedication we are very excited to share our recent news regarding our multi centre randomized control study for high risk, exacerbation-prone COPD patients in primary care. The study was published in the peer reviewed Nature Partner Journal (NPJ) Primary Care Respiratory Medicine. The research was led by Asthma Research Group Inc. (ARGI) founder Dr. Christopher Licskai, Respirologist, (Western Professor of Health System Innovation) and Coordinator Madonna Ferrone, Registered Respiratory Therapist/Certified Respiratory Educator RRT/CRE. The patients were randomized to either “intervention” receiving integrated disease management (IDM) provided by a RRT/CRE and physician or “usual physician care”.

The patients in the IDM group received case management, self-management education, and skills training. Of the 180 patients randomized from 8 sites, 81.1% completed the study. 53.6% were women, overall mean age of 68.2 years, post-bronchodilator FEV₁ 52.8% predicted, and 77.4% were Global Initiative for Obstructive Lung Disease Stage D. The primary outcome, COPD-related quality of life (QoL), was measured using the COPD Assessment Test (CAT). QoL-CAT scores improved in IDM patients, 22.6 to 14.8 and worsened in usual care 19.3 to 22.0, [adjusted difference 9.3 (p<0.001)]. Secondary outcomes included the Clinical COPD Questionnaire, Bristol Knowledge Questionnaire, and FEV₁ demonstrated differential improvements in favour of IDM of 1.29 (p<0.001), 29.6% (p<0.001), and 100 mL respectively (p=0.016). Compared to usual care, significantly fewer IDM patients had a severe exacerbation, -48.9% (p<0.001), required an urgent primary care visit for COPD, -30.2% (p<0.001), or had an emergency department visit, -23.6% (p=0.001). We conclude that IDM self-management and structured follow-up substantially improved QoL, knowledge, FEV₁, reduced severe exacerbations and health service utilization (HSU) in a high-risk primary care COPD population. You can find the full study in the Primary Care Respiratory Medicine (2019) 29:8 ; <https://doi.org/10.1038/s41533-019-0119-9>

ARGI is a not-for-profit organization that integrates CRE/RRT leaders with community-based physicians, nurse practitioners and multidisciplinary teams. ARGI has been leading primary care health system innovation in the Erie St. Clair LHIN since 2003. The heart of the ARGI programs lies with the dedicated CRE/RRT's who provide timely, patient centered, evidence-based care within a multidisciplinary team. ARGI's inception focused on asthma management in 2003 then expanded to COPD in 2009. Over the past two years, ARGI has further expanded in collaboration with their multidisciplinary teams into management of heart failure and atrial fibrillation.

ARGI's vision and commitment was embraced by community partners and seven family health teams within Windsor-Essex/Chatham-Kent in 2009 and collaboratively they developed the Primary Care Innovation Collaborative (PCIC). The PCIC has a focus on health system innovation and the development and implementation of programs for patients with chronic disease. Together ARGI and the PCIC have created *de novo*, a regional primary care chronic disease health system with a robust evaluated proven clinical program with high performing health teams.

ARTICLE OPEN

The impact of integrated disease management in high-risk COPD patients in primary care

Madonna Ferrone^{1,2}, Marcello G. Masciantonio^{1,3}, Natalie Malus^{1,3}, Larry Stitt⁴, Tim O'Callahan⁵, Zofe Roberts¹, Laura Johnson⁶, Jim Samson⁷, Lisa Durocher⁷, Mark Ferrari⁸, Margo Reilly⁹, Kelly Griffiths¹⁰, Christopher J. Licskai^{1,3,4} and The Primary Care Innovation Collaborative

Patients with chronic obstructive pulmonary disease (COPD) have a reduced quality of life (QoL) and exacerbations that drive health service utilization (HSU). A majority of patients with COPD are managed in primary care. Our objective was to evaluate an integrated disease management, self-management, and structured follow-up intervention (IDM) for high-risk patients with COPD in primary care. This was a one-year multi-center randomized controlled trial. High-risk, exacerbation-prone COPD patients were randomized to IDM provided by a certified respiratory educator and physician, or usual physician care. IDM received case management, self-management education, and skills training. The primary outcome, COPD-related QoL, was measured using the COPD Assessment Test (CAT). Of 180 patients randomized from 8 sites, 81.1% completed the study. Patients were 53.6% women, mean age 68.2 years, post-bronchodilator FEV₁ 52.8% predicted, and 77.4% were Global Initiative for Obstructive Lung Disease Stage D. QoL-CAT scores improved in IDM patients, 22.6 to 14.8, and worsened in usual care, 19.3 to 22.0, adjusted difference 9.3 ($p < 0.001$). Secondary outcomes including the Clinical COPD Questionnaire, Bristol Knowledge Questionnaire, and FEV₁ demonstrated differential improvements in favor of IDM of 1.29 ($p < 0.001$), 29.6% ($p < 0.001$), and 100 mL, respectively ($p = 0.016$). Compared to usual care, significantly fewer IDM patients had a severe exacerbation, -48.9% ($p < 0.001$), required an urgent primary care visit for COPD, -30.2% ($p < 0.001$), or had an emergency department visit, -23.6% ($p = 0.001$). We conclude that IDM self-management and structured follow-up substantially improved QoL, knowledge, FEV₁, reduced severe exacerbations, and HSU, in a high-risk primary care COPD population. [Clinicaltrials.gov NCT02343055](https://doi.org/10.1038/s41533-019-0119-9).

npj Primary Care Respiratory Medicine (2019)29:8; <https://doi.org/10.1038/s41533-019-0119-9>

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a progressive lung disease characterized by increasing symptoms, decreasing (QoL), and increasing frequency of exacerbations.^{1–4} These inter-related patient outcomes are the foundational elements of the current Global Initiative for Chronic Obstructive Lung Disease (GOLD) severity classification (A–D).¹ GOLD A and B patients are low and medium-risk patients who infrequently experience exacerbations.¹ Collectively, GOLD C and D patients are high-risk patients defined by frequent exacerbations and/or a severe exacerbation requiring hospitalization.¹ The high-risk “frequent-exacerbation” COPD phenotype persists over time,⁵ and accounts for one-third of the COPD patient population.² Exacerbations exact a substantial personal toll on COPD patients, reducing their QoL significantly.^{6–8} In addition, COPD-related hospitalization accounts for more than half the cost of managing COPD in our health systems.^{9,10} International practice guidelines recommend effective pharmacologic and non-pharmacologic interventions to specifically address these patient and health system outcomes^{1,11,12}; however, the impact of these recommendations on high-risk COPD patients in our communities

has been limited by a substantial knowledge-to-care implementation gap.

The majority of COPD patients are managed by primary care practitioners.^{13,14} Although evidence-based management of COPD is increasingly complex, primary care providers manage high-risk COPD patients with multiple comorbidities within health systems that have enduring challenges. There are diagnostic barriers related to spirometry access and utilization.^{15–18} There is a low level of provider knowledge of COPD clinical practice guidelines.^{15–18} Chronic management of severe COPD requires multiple medications provided in different inhalation devices. To achieve self-efficacy, patients require self-management education and ongoing support. In practical terms, these evidence-based objectives are difficult to achieve by individual practitioners within the context of a regular clinical encounter. Thus, in practice, a minority of patients have an objectively confirmed diagnosis, or action plan, receive smoking cessation counseling, and for many medications, are under-prescribed relative to disease severity.^{15–22} Narrowing the knowledge-to-care implementation gap in primary care requires transformative innovation.

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A list of consortium members appears before acknowledgments.

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ARGI's commitment to rigorous evaluation and research has led them to their most recent achievement with the spread of their ARGI Best Care COPD Program to the South West LHIN. The Best Care COPD program has been internationally recognized by the European Respiratory Society for BEST PRIMARY CARE Abstract in 2016 and prior to this awarded an HONORARY MINISTERS MEDAL in 2013 for its Regional Respiratory Primary Care Program. ARGI continues to forge new paths for the respiratory profession and is in the final process of developing a randomized control trial robust evaluation for heart failure and atrial fibrillation for fall of 2019.

PEP UPDATE

The Ontario Lung Association's website has a new healthcare professional section – Clinical Practice and Education. The new healthcare professional section highlights clinical practice models (including the Primary Care Asthma Program and Emergency Department Asthma Care Program) and educational programs and offers free, easy to access clinical tools and resources for both patients and providers.



This new section is easy to navigate and provides respiratory healthcare professionals the tools and practical applications they need to provide optimal care for patients living with lung disease. Our interdisciplinary educational programs offer healthcare professionals the opportunity to update their education, learn new skills and share best practice.

Here is a sample of what you will find when you visit the site:

Professional Education contains information about a variety of continuing medical education opportunities including our annual Better Breathing conference and Respiratory Health Forum, Mainpro+ certified in-person workshops and online e-modules on a wide range of topics from diagnosis and management of asthma and COPD, Spirometry Interpretation, and Motivational Interviewing.



CLINICAL PRACTICE & RESOURCES

Learn more about evidence-based clinical guidelines and our best practice program models for healthcare professionals to diagnose, treat, and manage lung disease.



Clinical Programs

The Lung Association is dedicated to providing healthcare professionals with evidence-based tools



Clinical Tools

The Lung Association is committed to providing free, easy to access evidence-based clinical tools and

CLINICAL PRACTICE & EDUCATION

CLINICAL PUBLICATIONS

PROFESSIONAL SOCIETIES & MEMBERSHIPS

CLINICAL PRACTICE & RESOURCES

PATIENT RESOURCES

CLINICAL GUIDELINES & POSITION STATEMENTS

CLINICAL TOOLS

CLINICAL PROGRAMS

PROFESSIONAL EDUCATION



Clinical Practice and Resources

provides information about evidence-based clinical guidelines, tools and resources, and our best practice program models to help healthcare professionals to diagnose, treat, and manage lung disease. Check out our recently updated clinical tools, such as the Respiratory Medications Reference, our Adult and Pediatric Asthma Action plans, and the Spirometry Interpretation Guide.

Professional Societies and Membership – Learn more about The Lung Association’s two societies for healthcare professionals committed to promoting the respiratory health of Ontarians through research, education and clinical practice – the Ontario Thoracic Society (OTS) and the Ontario Respiratory Care Society (ORCS). Check out the benefits of becoming a member and join today!

PROFESSIONAL SOCIETIES & MEMBERSHIPS

The Lung Association has two societies of healthcare professionals committed to promoting the respiratory health of Ontarians through research, education and practice – the Ontario Thoracic Society (OTS) and the Ontario Respiratory Care Society (ORCS).



Ontario Respiratory Care Society (ORCS)

Membership in the Ontario Respiratory Care Society (ORCS) is open to nurses, physiotherapists,



Ontario Thoracic Society (OTS)

Membership in the Ontario Thoracic Society (OTS) is open to physicians and researchers with an interest in respiratory medicine, including residents and fellows

CLINICAL PRACTICE & EDUCATION

CLINICAL PUBLICATIONS

PROFESSIONAL SOCIETIES & MEMBERSHIPS

ONTARIO RESPIRATORY CARE SOCIETY (ORCS)

ONTARIO THORACIC SOCIETY (OTS)

CLINICAL PRACTICE & RESOURCES

PROFESSIONAL EDUCATION



Find out what is new by checking out our most recent publications written by healthcare professionals, physicians and researchers in respiratory health in the **Clinical Publications** section.

We encourage you to check out the new site and to share this invitation with others that would be interested in learning more about our offerings.

<https://lungontario.ca/clinical-practice-education>

To set up a free workshop for your team or organization, please contact us at pep@lungontario.ca. We will work with you to ensure your learning outcomes are achieved.