

Building and implementing best practices for referral and management of severe asthma in Canadian healthcare

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Received date: April 18, 2023

Accepted date: April 24, 2023

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Abstract

Background: Despite adherence to maximal inhaled therapy, 5-10% of asthma patients in Canada still suffer from poorly controlled symptoms. These severe asthma patients have frequent exacerbations as well as increased morbidity and mortality, not only associated with the disease but in some cases the medications used to treat it. Asthma patients often rely on the use of short-acting beta-2 agonists and oral corticosteroids to manage their symptoms on a day-to-day basis. Overuse of these medications is problematic, as patients are at an increased risk of treatment related side effects. Overuse also suggests uncontrolled asthma which could be due to the presence of undiagnosed severe asthma. The objective of this commentary is to describe the asthma crisis in Canada, followed by consensus-based recommendations on best practices for its treatment and management, and their implementation.

Consensus Recommendations: Previous consensus-based research has highlighted areas where changes in care are most required. Core recommendations from this research aim to shift care to a more proactive approach, where healthcare providers think critically about patients whose asthma is not well controlled in addition to educating patients on their condition, and empowering them to seek care if their symptoms worsen.

Implementing Change: To successfully implement the proposed changes will require a concerted effort from all stakeholders. The core recommendations can be actioned at each level of the healthcare pathway, and include input from respiratory specialists (including respirologists, allergists, respiratory educators), nurses, pharmacists, general practitioners, and patients.

Conclusions: The core recommendations outlined can be easily implemented across the asthma and severe asthma treatment pathways in Canada. Taking a more proactive approach to severe asthma has the potential to improve patient outcomes through earlier diagnosis and treatment, whilst alleviating pressure on the health system.

Keywords: Asthma, Best practice, Biologics, Consultation and referral, Primary care, Health care, Canada

Background

Severe asthma (SA) is asthma that remains uncontrolled despite patient adherence to maintenance therapies and management of contributing factors, or asthma which worsens when high-dose treatments are reduced [1]. It is estimated that 5-10% of asthma patients in Canada have SA [2]. The condition is a significant burden on patients' quality of life [3], and is associated with increased number and severity of exacerbations, hospitalizations, and mortality [4]. The prevalence of other serious conditions such as dyspeptic disorders (e.g., gastric ulceration), mood disorders, bone loss, osteoporosis, cataracts, and chronic kidney disease is estimated to be 2-5 times higher in SA patients than those without SA, many of which can be attributed to SA treatment [5]. The economic burden of SA is also high, accounting for approximately 50% of all direct asthma-related costs [2], and the treatment of comorbidities accounts for more than half of the incremental costs of managing SA patients [5].

Asthma symptoms and exacerbations are often alleviated through the use of short acting beta-2 agonists (SABAs) and oral corticosteroids (OCS) [1,6]. However, the overuse of these medications

can be associated with increased psychological and physical side effects [1,6]. Canadian cohort data from the global SABA in Asthma (SABINA) study showed that SABA overuse is substantial, with an increased annual rate of exacerbations compared to those who do not overuse SABAs [7]. Regular use of SABA and OCS therapies can also indicate that asthma symptoms are not controlled [8]. A pattern of regular use should trigger an asthma review, and if SA is suspected, a referral to a specialist for evaluation [2,8].

SA is a heterogeneous disease with multiple phenotypes, and the diagnostic process should include an assessment of phenotype through biomarker measurements and identification of key clinical characteristics. This will provide the opportunity for more personalised disease management through the use of targeted therapies [2]. Biologic therapies act on the pathways involved in the pathogenesis of asthma, and use of biologics is associated with a reduction in the use of OCS and risk of exacerbations, and improvements to quality of life [3,9]. However, it has been reported that while 14% of asthma patients in Canada were deemed candidates for a biologics, half of

these (7%) were unable to start treatment due to lack of access [8]. Reimbursement for biologic therapies varies across provinces, with treatment availability dependent on the insurance company involved [9]. Despite growing calls for the use of these targeted therapies to treat SA, there still remains a lack of awareness of treatment options amongst physicians and patients [8,10].

It is critical that SA patients are identified and treated in a timely manner, with appropriate access to specialist services and treatments. To ensure patients' needs are met will require better implementation of current guidelines, with input and action from multiple stakeholders. An overview of this process is seen in **Figure 1**. Further to summarizing the difficulties faced by asthma care services in Canada, the objective of this commentary is to outline:

1. The consensus and vision for change in SA care that have been developed to date
2. How to successfully action and implement these innovations

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Figure 1. The process for implementing improvements to asthma care.

Consensus Recommendations

Consensus research published earlier in 2023 began to address the issues currently faced by healthcare practitioners and patients in diagnosing and managing severe asthma [11]. This research used a modified Delphi methodology to assess the level of consensus across healthcare practitioners working in relevant care areas. The Delphi methodology is used in healthcare research to provide real world evidence based on the opinions and practices of experts. It utilizes input from a wide range of specialists, guided by an independent facilitator, to understand problems, while providing the basis for actionable change [12]. Such methods have been used successfully across multiple therapeutic areas.

Initially a steering group (the authors) were formed, who discussed the issues facing treatment of severe asthma, assisted by an independent facilitator (Triducive Partners Limited). A series of 43 consensus statements were created, ratified anonymously, and then sent electronically to a wider number of experts. These included Certified Respiratory Educators (CREs), respirologists, allergists, general practitioners, nurses, pharmacists, and respiratory therapists. The group set the minimum threshold for consensus as 75%, a widely accepted level [13]. A total of 150 responses were received. The consensus for the statements was very high (>90%) in 37 (86%) of statements, and high (>75%) in 4 (9%) of statements [11]. Only 2 statements (5%) did not achieve consensus.

From the degree of consensus it is clear that there is support in Canada for achieving the highest level of severe asthma care. Based on the analysis of consensus levels for each statement, a series of recommendations for the improvement of care were created. These recommendations are presented below with the core recommendations in bold:

- 1. Primary care clinicians should pro-actively identify suspected severe asthma patients for optimization (including appropriate referral)**
- 2. Pharmacy (either community- or hospital-based) should be utilized to help identify potential severe asthma patients**
- 3. Asthma patients that have a history of overuse of SABA and/or repeat OCS therapies should be assessed for severe asthma**
- 4. All patients should receive education about their asthma from an asthma educator**
- 5. Access to diagnostic tools (including spirometry, lung function test etc.) within 4 weeks of request should be an expected standard within Canada**
6. A consistent pathway for referral of suspected severe asthma patients should be in place across Canada with clearly defined criteria and acceptable waiting time
7. The choice of biologic therapy should be driven by disease phenotype, which is determined by clinical history, comorbidities, biomarkers, and spirometry
8. Initiation of a biologic therapy should be within 2–4 weeks of approval
9. National Pan-Canadian data collection about severe asthma should be established

10. Patients should be empowered to work together with their HCPs, through shared decision-making tools, to manage their symptoms and control their asthma

Recommendations were prioritized by the steering group in subsequent meetings. The group ratified these as being the ‘most’ important for target audiences, which if feasible, would provide the highest impact to improving asthma care. The first three core recommendations are aimed at changing the behaviour of healthcare practitioners (family doctors, pharmacists, nurses, respiratory therapists, ER doctors, specialist care practitioners) to a more pro-active approach in identifying at-risk patients. The final recommendation aims to ensure the inclusion of patients in their care, empowering them to seek out advanced care should they feel they meet criteria for severe asthma.

Implementing Change

According to Kotter’s method for leading change, the first step is to create urgency around the area in which change is required [14]. Building on this, a guiding team can be formed to help create a vision for change and communicate this to a wider audience [15]. These steps have already been fulfilled through the creation of the PRECISION group (a multidisciplinary global programme for improving SA care), the project steering group, and the undertaking of the Delphi study. They provide the basis for subsequent stages, which centre around removing obstacles which hinder change, creating short-term wins to sustain momentum [14,16]. These wins then create replicable best practice case studies which can be used to inform policy updates, embedding change into wider practice [15].

As has been noted in previous healthcare research, allowing change is not the same as implementing change [17]. Therefore, to help stakeholders incorporate proposed changes into their current practice, a series of thoughts and actions is suggested. These are presented in **Table 1**.

Conclusions

The underdiagnosis of severe asthma represents a significant health priority in Canada. It also represents a large financial burden on the health system. Identifying and treating these patients adequately with appropriate medications (biologics and other targeted therapeutics) will ensure their asthma is better managed, improving quality of life and reducing the number and severity of exacerbations.

The need for change is clear, and there is growing support to modify current practice and innovate the way severe asthma patients receive care. The next steps in achieving this will involve more pro-active behaviours from all healthcare providers who manage SA to empower and educate their patients.

Ethics Approval and Consent to Participate




Not applicable

Consent for Publication

Not applicable.

Availability of Data and Materials

Not applicable.

Table 1. Beliefs and behaviors which should be enacted by each stakeholder to improve asthma care.		
 Stakeholder	 Think	 Do
Specialists	≥ 2 OCS courses is not acceptable and/or ≥ 3 SABA inhalers is not acceptable	I should investigate further and consider severe asthma
	This may be severe asthma requiring a biologic	I should educate non-specialists to ensure they understand the signs of severe asthma
Family Physicians	Asthma patients may inappropriately rely on OCS and SABA	I should monitor my patients for the underuse and overuse of SABA and OCS
	There must be an alternative way to treat and gain better control	I should ensure my patients receive individualized asthma education
Pharmacy	Asthma patients may overuse their therapies	I should monitor ICS, OCS, and SABA use and alert the family physician or specialist of inappropriate use
	≥ 2 OCS courses is not acceptable and/or ≥ 3 SABA inhalers is not acceptable	I should ensure patients receive individualized asthma education
CRE	I have expertise that is beneficial and valued	I will educate patients to ensure their asthma is well-managed
	I need clear referral pathways	I will collaborate with family physicians and specialists to improve patient care
Patients	If I haven't received asthma education, I should seek more information	I should access educational asthma resources, preferably through a CRE
	I need to understand that asthma is a chronic disease, and I can do more to manage it	Through education, I can challenge my need for OCS

Competing Interests

All authors received honoraria for consultancy services on the Delphi project from AstraZeneca, in addition: K Godbout grants, contracts, consulting fees, support for travel, or honoraria from AstraZeneca, Covis, GlaxoSmithKline, TEVA, Valeo and Viatrix. M Bhutani reports grants, contracts, consulting fees, support for travel, or honoraria from CIHR, AstraZeneca, GlaxoSmithKline, Novartis, Grifols, Sanofi, Covis, Valeo, Lung Association of Saskatchewan, Canadian Thoracic Society, Lung Association of Alberta and Northwest Territories; leadership roles with Canadian Thoracic Society and Alberta Health Services; Canadian Thoracic Society Executive Committee, Co-Chair of the CTS COPD Clinical Assembly; Chair of the Royal College of Physicians and Surgeons Adult Respiratory Examination. D Dorscheid reports grants, contracts, consulting fees, support for travel, or honoraria from

Sanofi Regeneron, Novartis Canada, AstraZeneca, GlaxoSmithKline and Valeo Pharma. DD is on faculty at the University of British Columbia and is supported by the following grants: Canadian Institutes of Health Research, British Columbia Lung Association, and Michael Smith Foundation for Health Research. DD is an active member of Canadian Thoracic Society, American Thoracic Society, European Respiratory Society, and the Allergen Research Network. A G Kaplan reports consulting fees or honoraria from ALK, AstraZeneca, Bellus, BI, Covis, Cipla, Eisai, GlaxoSmithKline, Merck Frosst, Moderna, Novo Nordisk, Pfizer Sanofi, Teva, Trudell, Valeo; Chairperson of Family Physician Airways Group of Canada; Vice President of Respiratory Effectiveness Group. AGK is an Honorary Professor of Primary Care Respiratory Research, Observational and Pragmatic Research Institute; Medical Director, local pulmonary rehabilitation program; Board member, Thrombosis Canada; Senate member of the International Primary Care Respiratory

Group. S Waserman reports consulting fees from GSK, Novartis, CSL Behring, Pfizer Canada, Sanofi Canada, AstraZeneca, Takeda, ALK Abello, Teva, Medexus, MiravoHealth, Mylan, Bausch Lomb, AbbVie, Avir Pharma, Leo Pharma, Valeo; research grants from Pfizer Canada, ALK Abello, Aimmune; is current President of Canadian Allergy, Asthma and Immunology Foundation; is currently on the Board of Directors for Asthma Canada. The following authors report no other competing interests: L Connors, CKN Chan, C Connors, G Dyck, J Reynolds.

Funding

This project was initiated & funded by AstraZeneca Canada Ltd. (AstraZeneca) and the PRECISION program. The PRECISION program aims to work with national healthcare systems to improve the way severe asthma services are designed, funded, and structured, to better align with the needs of individual patients and improve their care and outcomes. It is a multi-disciplinary and collaborative program, encompassing medical education, service improvement and policy reform, to create an environment designed to reduce the devastating impact of severe asthma in both the short and longer term.

Authors' Contributions

All authors were involved in the initial Delphi study and contributed to the development of the manuscript.

Acknowledgements

AstraZeneca Canada Ltd. initiated and fully supported the consensus project including the selection of the initial faculty of experts. On behalf of AstraZeneca Canada Ltd., Andrew Foster, Christal Gray, Arsh Randhawa, Kaylyn Sutcliffe, supported the project and provided editorial assistance for the final manuscript by way of a factual accuracy check. Katie Larner, Dal Singh, and Tim Warren worked on behalf of Triducive Partners Ltd. as project facilitators and to provide medical writing support.

References

1. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention. (2022).
2. FitzGerald JM, Lemiere C, Lougheed MD, Ducharme FM, Dell SD, Ramsey C, et al. Recognition and management of severe asthma: a Canadian Thoracic Society Position Statement. *Canadian Journal of Respiratory, Critical Care, and Sleep Medicine.* 2017;1(4):199-221.
3. Hossny E, Caraballo L, Casale T, El-Gamal Y, Rosenwasser L. Severe asthma and quality of life. *World Allergy Organization Journal.* 2017 Jan 1;10:28.
4. Husereau D, Goodfield J, Leigh R, Borrelli R, Cloutier M, Gendron A, et al. Severe Asthma In Primary Care In Canada: A Longitudinal Study Of The Clinical Burden And Economic Impact Based On Linked Electronic Medical Record Data. *American Journal of Respiratory and Critical Care Medicine.* 2017;195:A1368.
5. Chen W, Safari A, FitzGerald JM, Sin DD, Tavakoli H, Sadatsafavi M. Economic burden of multimorbidity in patients with severe asthma: a 20-year population-based study. *Thorax.* 2019 Dec 1;74(12):1113-9.
6. Noorduyn S, Soliman M, Johnston K, Christina Q, Hernandez P, Penz E. SABA Overreliance and Physician Visits in Canada. *European Respiratory Journal.* 2020;56:4645.
7. Noorduyn SG, Qian C, Johnston KM, Soliman M, Talukdar M, Walker BL, et al. SABA use as an indicator for asthma exacerbation risk: an observational cohort study (SABINA Canada). *ERJ Open Research.* 2022 Jul 1;8(3).
8. The Canadian Lung Association. Moving the dial on the diagnosis and treatment of asthma. (2019).
9. Chapman KR, Penz E, FitzGerald JM. Targeted management of severe asthma: Developing a Canadian approach. *Canadian Journal of Respiratory, Critical Care, and Sleep Medicine.* 2020 Apr 2;4(2):124-32.
10. Murray S, Labbé S, Kaplan A, Petrasko K, Waserman S. A multi-stakeholder perspective on asthma care in Canada: findings from a mixed methods needs assessment in the treatment and management of asthma in adults. *Allergy, Asthma & Clinical Immunology.* 2018 Dec;14:1-3.
11. Godbout K, Bhutani M, Connors L, Chan CK, Connors C, Dorscheid D, et al. Recommendations from a Canadian Delphi consensus study on best practice for optimal referral and appropriate management of severe asthma. *Allergy, Asthma & Clinical Immunology.* 2023 Dec;19(1):1-2.
12. Fink-Hafner D, Dagen T, Doušak M, Novak M, Hafner-Fink M. Delphi method: strengths and weaknesses. *Advances in Methodology and Statistics.* 2019 Jul 1;16(2):1-9.
13. Diamond IR, Grant RC, Feldman BM, Pencharz PB, Ling SC, Moore AM, et al. Defining consensus: a systematic review recommends methodologic criteria for reporting of Delphi studies. *Journal of Clinical Epidemiology.* 2014 Apr 1;67(4):401-9.
14. Harrison R, Fischer S, Walpola RL, Chauhan A, Babalola T, Mears S, et al. Where do models for change management, improvement and implementation meet? A systematic review of the applications of change management models in healthcare. *Journal of Healthcare Leadership.* 2021 Mar 12:85-108.
15. Auguste J. Applying Kotter's 8-step process for leading change to the digital transformation of an orthopedic surgical practice group in Toronto, Canada. *J Health Med Informat.* 2013;4(3):129.
16. Tsuyuki RT, Schindel TJ. Changing pharmacy practice: the leadership challenge. *Canadian Pharmacists Journal/Revue Des Pharmaciens Du Canada.* 2008 May;141(3):174-80.
17. Teixeira B, Gregory PA, Austin Z. How are pharmacists in Ontario adapting to practice change? Results of a qualitative analysis using Kotter's change management model. *Canadian Pharmacists Journal/Revue des Pharmaciens du Canada.* 2017 May;150(3):198-205.