QUALITY STANDARDS

Asthma

Care in the Community for People Under 16 Years of Age

2025 UPDATE

Ontario Health

Scope of This Quality Standard

This quality standard addresses the diagnosis and management of asthma in children and adolescents under 16 years of age, with a focus on primary care and community-based settings. It addresses referral to specialized pediatric asthma care for children and adolescents who have indications characterizing severe asthma, but it does not address the management of severe asthma in specialized care, acute asthma exacerbations, or care provided during emergency department visits or hospitalizations.

The *Clinical Handbook for Paediatric Asthma* by the Provincial Council for Maternal and Child Health and the Lung Health Foundation addresses the emergency department and inpatient episodes of care.[1]

A separate quality standard addresses *Asthma in Adults*.[2]

What Is a Quality Standard?

Quality standards outline what high-quality care looks like for conditions or processes where there are large variations in how care is delivered, or where there are gaps between the care provided in Ontario and the care patients should receive. They:

- Help patients, families, and care partners know what to ask for in their care
- Help clinicians know what care they should be offering, based on evidence and expert consensus
- Help health care organizations measure, assess, and improve their performance in caring for patients

Quality standards and their accompanying patient guides are developed by Ontario Health, in collaboration with clinicians, patients, and care partners across Ontario.

For more information, contact QualityStandards@OntarioHealth.ca.

Quality Statements to Improve Care: Summary

These quality statements describe what high-quality care looks like for children and adolescents with asthma.

Quality Statement 1: Diagnosis

Children 6 years of age and older and adolescents clinically suspected of having asthma complete spirometry to demonstrate reversible airflow obstruction and, if negative, other lung function testing to confirm the diagnosis of asthma, as soon as possible. Children 1 to 5 years of age are diagnosed with asthma after documentation of signs or symptoms of airflow obstruction, clear improvement in signs and symptoms with asthma medications, and no clinical suspicion of an alternative diagnosis.

Quality Statement 2: Asthma Control and Risk of Exacerbations

Children and adolescents with asthma have a structured assessment at least annually to determine their level of asthma control, reasons for poor control, and risk of future exacerbations.

Quality Statement 3: Asthma Medication

Children and adolescents with asthma receive appropriate medication and devices based on their age, current level of asthma control, and risk of future exacerbations, including early initiation of regular inhaled anti-inflammatory therapy.

Quality Statement 4: Self-Management Education and Asthma Action Plan

Children and adolescents with asthma and their care partners receive self-management education and a written personalized asthma action plan that is reviewed regularly with a clinician.

Quality Statement 5: Referral to Specialized Pediatric Asthma Care

Children and adolescents with asthma with appropriate indications are referred to specialized pediatric asthma care.

Quality Statement 6: Follow-Up After Discharge

Children and adolescents who have had an emergency department visit or been hospitalized for an asthma exacerbation have a follow-up assessment within 2 to 7 days after discharge.

Table of Contents

List of Abbreviations

Abbreviation	Definition
ACQ	Asthma Control Questionnaire
ACT	Asthma Control Test
ATS	American Thoracic Society
BTS	British Thoracic Society
bud/form	budesonide/formoterol
CAE	certified asthma educator
CRE	certified respiratory educator
CTS	Canadian Thoracic Society
DPI	dry powder inhaler
ERS	European Respiratory Society
FeNO	fractional exhaled nitric oxide
FEV_1	forced expiratory volume in 1 second
FVC	forced vital capacity
ICS	inhaled corticosteroid
IDAT	inhaler device assessment tool
LABA	long-acting β2-agonist
LLN	lower limit of normal
LTRA	leukotriene receptor antagonist
MDI	metered-dose inhaler
NICE	National Institute for Health and Care Excellence
OHIP	Ontario Health Insurance Plan
PEF	peak expiratory flow
ppb	parts per billion
SABA	short-acting β2-agonist
SIGN	Scottish Intercollegiate Guidelines Network

2025 Summary of Updates

In 2024, we completed a review of the evidence to capture new or updated clinical practice guidelines and health technology assessments published since the original release of this quality standard in 2020. This update aligns the quality standard with the most recent clinical evidence and with current practice in Ontario.

Below is a summary of changes to the overall quality standard:

- Updated links, secondary references, and data sources where applicable
- Updated the scope of the quality standard to include reference to the updated clinical handbook[1]
- Revised the accompanying resources (i.e., patient guide, placemat, case for improvement slide deck, technical specifications) to reflect changes to the quality standard
- Updated the data in the Why This Quality Standard Is Needed section and in the case for improvement slide deck, where applicable
- Revised the Guiding Principles section and added a guiding principle on integrated care
- Updated terminology throughout where applicable, including:
    - *Caregiver* changed to *care partner*
    - *Family doctor or nurse practitioner* changed to *primary care clinician*
    - *Health care professionals* changed to *clinicians*

Below is a summary of changes to specific quality statements:

- Quality statement 1:
    - Updated the quality statement to replace “reversibility of symptoms” with “clear improvement in signs and symptoms”
    - Updated the definition of *spirometry* to use a race-neutral approach for interpreting spirometry based on the recent ATS consensus statement,[3] and to include the recently updated ERS and ATS definition of bronchodilator reversibility supportive of a diagnosis of asthma[4]
    - Updated the definition of *other lung function testing* to include FeNO testing
- Quality statement 2:
    - Updated the quality statement to include an assessment for risk of future exacerbations and an associated definition
    - Updated the definition of *symptom control* to decrease the target for the frequency of daytime symptoms and for the need for reliever medication from < 4 days per week and < 4 doses per week to ≤ 2 days per week and ≤ 2 doses per week, respectively

- Modified the definition of *lung function* to highlight that FeNO testing is not recommended for monitoring asthma control and risk of future exacerbations
- Updated the definition of *at least annually* to align criterion for SABA overuse with updated CTS 2021 guidelines[5,6]

- Quality statement 3:
  - Updated the quality statement to add "risk of future exacerbations" and a brief definition referring to the fulsome definition in quality statement 2
  - Updated the definition of *appropriate medication and devices* to add considerations for the use of low carbon footprint inhalers in alignment with the Choosing Wisely Canada recommendation and CTS position statement,[7,8] and to emphasize shared decision-making
  - Updated the definition of *appropriate medication and devices* and the "For Clinicians" audience statement to align the stepwise approach for medications with the updated CTS 2021 guidelines and the BTS, NICE, and SIGN 2024 guideline,[5,6,9] and to emphasize shared decision-making
- Quality statement 4:
  - Updated the definition of *self-management education* to include considerations for virtual care or computerized decision support systems, based on the BTS, NICE, and SIGN 2024 guideline[9]
- Quality statement 5:
  - Updated the definition of *appropriate indications* for referral to specialized pediatric asthma care to align the criterion on the number of emergency department visits and hospitalizations within a 12-month period with the CTS 2021 guideline and BTS, NICE, and SIGN 2024 guideline[5,9]
- Quality statement 6:
  - Added "advisory committee consensus" as a source due to the lack of recommendations within updated guidelines
  - Updated the definition of *follow-up assessment* to include referral to an asthma education program, as well as to specialized pediatric asthma care for children and adolescents who were hospitalized and/or required treatment in intensive care

Why This Quality Standard Is Needed

Asthma is a chronic inflammatory disorder of the airways in the lungs. In people with asthma, the airways become inflamed and obstructed, usually because they are hyperresponsive to internal or external factors commonly called triggers (e.g., allergens, irritants).[10,11] People with asthma typically experience difficulty breathing, shortness of breath, chest tightness, wheezing (a whistling sound produced in the airways during breathing), sputum (mucus) production, and/or cough. These symptoms can be episodic or persistent. As with many chronic conditions, the cause of asthma is not known with certainty, but it is thought to develop from interactions between genetic and environmental factors such as a family history of asthma and exposure to smoke, air pollution, or occupational vapours or particles.[12,13]

In Ontario, it is estimated that nearly 2.5 million people were living with asthma in 2022/23.[14] Although asthma affects people of all ages, the incidence of asthma is higher in childhood; in 2022/23, it was highest among children under 5 years of age at 24 per 1,000 children compared with 3 per 1,000 people among all ages combined.[15] Asthma is one of the most common chronic diseases of childhood in Canada, with nearly half a million people under 20 years of age living with the disease in 2022/23, and over 60% of prevalent cases occurring in people under 15 years of age.[14] In recent years, the incidence of asthma in Ontario (the number of people newly diagnosed each year) has been decreasing for all age groups combined; it dropped from nearly 8 new cases per 1,000 people in 2000/01 to 3 per 1,000 in 2022/23.[15] At the same time, because people are generally living longer, the prevalence of asthma in Ontario (the total number of people living with the disease) continued to increase for all age groups combined; it rose from around 114 per 1,000 people in 2000/01 to 156 per 1,000 in 2022/23.[14] Both incidence and prevalence vary substantially across the province; in 2022/23, the East region had the highest prevalence rate of asthma, whereas the Toronto region had the lowest prevalence rate.[14,15]

Although asthma has no cure, most people can control their asthma by using appropriate controller medications, such as ICS, and reducing their exposure to triggers. The primary goal of asthma care is to help people achieve and maintain asthma control, which reduces the risk of having an exacerbation (a flare-up or asthma attack) and improves their overall health and quality of life.[10] Current guidelines stress that, with appropriate management in primary care, most people with asthma should be able to live symptom free. Exacerbations requiring oral corticosteroids, an emergency department visit, or hospitalization should usually be considered a failure of asthma management. Every asthma death should be considered preventable.[5,6]

However, it is estimated that 50% of people with asthma in Canada have uncontrolled disease, resulting in unnecessary reductions in quality of life and avoidable illness and deaths.[16,17] In Ontario, about 90 people die from asthma each year (1,704 deaths from 2000 to 2018[18]). The age- and sex-adjusted all-cause mortality rate for people living with asthma remains higher than for the population overall (in 2008, there were 852 deaths per 100,000 people with asthma versus 640 per 100,000 in the general population[19,20]).

Uncontrolled asthma also contributes to high health care use and costs. Overall use of health services for people with asthma has been shown to be much higher for people with uncontrolled asthma[21] and

particularly high in the year prior to asthma-related deaths.[9,11] In Canada, asthma is the most common cause of hospital admission for children, and – based on measures of school absences, emergency department visits, and hospitalizations – one of the leading causes of morbidity from chronic disease among children and adolescents.[11,22] Age is a significant factor: in Ontario, rates of asthma-related hospitalization, emergency department visits, and OHIP claims are much higher among very young children (under 5 years of age) and young children (5 to 9 years of age) compared with older children and adolescents.[11,23] In 2022/23, there were over 12,000 asthma-specific emergency department visits[24] and over 5,000 asthma-specific hospitalizations among people 14 years of age and under in Ontario.[25]

Asthma is also associated with substantial indirect costs to society, such as absenteeism from school and work.[13] People diagnosed with asthma are more likely to have other chronic diseases and conditions such as diabetes, hypertension, and mood or anxiety disorders.[26,27] As a result, they often experience a lower quality of life compared with the general population, including lower productivity at work among caregivers of children with asthma.[28] The presence of comorbidities can also worsen asthma symptoms or the asthma itself, thus impeding appropriate asthma management.[29] The economic burden of asthma in Ontario (direct health care costs plus indirect social costs) was estimated at $1.8 billion in 2011.[30] The direct costs of asthma to the Canadian economy are projected to climb to $4.2 billion annually by 2030.[31]

These data highlight opportunities for improving the management of asthma. For example, the higher rates of hospitalization among the youngest children (under 5 years of age) are related to difficulties diagnosing and treating asthma in this age group; there are no objective tests available to confirm a diagnosis of asthma for children under 6 years of age, particularly because children in this age group are unable to perform lung function testing.[5,28,32] But these hospitalizations are considered largely preventable through improvements in the diagnosis and management of asthma in primary and community-based care settings. This standard focuses on helping clinicians diagnose asthma appropriately, recognize and address uncontrolled asthma, escalate and taper medication optimally, empower children and adolescents with asthma and their care partners to self-manage using an asthma action plan, and support safe, effective transitions in care. Improving the quality of asthma care can help children and adolescents better control their disease, preventing acute exacerbations, emergency department visits, hospital admissions, and deaths.

Measurement to Support Improvement

The Asthma Quality Standard Advisory Committee identified 9 overarching indicators to monitor the progress being made toward improving care for children and adolescents with asthma in Ontario.

Indicators That Can Be Measured Using Provincial Data

- Percentage of children and adolescents ≥ 6 to ≤ 15 years of age with incident asthma whose diagnosis is confirmed with lung function testing
- Percentage of children and adolescents ≥ 6 to ≤ 15 years of age with asthma who completed a lung function test in the previous 12 months
- Percentage of children and adolescents with asthma who visited the emergency department for an asthma-specific reason in the previous 12 months
- Percentage of children and adolescents with asthma who were hospitalized for an asthma-specific reason in the previous 12 months

Indicators That Can Be Measured Using Only Local Data

- Percentage of young children ≥ 1 to ≤ 5 years of age clinically suspected of having asthma whose diagnosis of asthma is confirmed after the documentation of signs or symptoms of airflow obstruction and clear improvement of those signs or symptoms with medication
- Percentage of children and adolescents with asthma who had a structured assessment in the previous 6 months
- Percentage of children and adolescents with asthma with 1 or more appropriate indications who are prescribed regular (daily) inhaled anti-inflammatory therapy
- Average number of asthma symptom–free days in the previous 4 weeks among children and adolescents with asthma
- Average number of days missed from school or work due to asthma in the previous 4 weeks

Quality Statement 1: Diagnosis

Children 6 years of age and older and adolescents clinically suspected of having asthma complete spirometry to demonstrate reversible airflow obstruction and, if negative, other lung function testing to confirm the diagnosis of asthma, as soon as possible. Children 1 to 5 years of age are diagnosed with asthma after documentation of signs or symptoms of airflow obstruction, clear improvement in signs and symptoms with asthma medications, and no clinical suspicion of an alternative diagnosis.

Sources: British Thoracic Society, National Institute for Health and Care Excellence, and Scottish Intercollegiate Guidelines Network, 2024[9] | Canadian Thoracic Society, 2021a[5] | European Respiratory Society, 2021[33] | National Heart, Lung, and Blood Institute and National Institutes of Health, 2020[34] | Ontario Health, 2024[35] | Registered Nurses' Association of Ontario, 2004[12]

Definitions

Clinically suspected of having asthma: Asthma is clinically suspected in the presence of signs or symptoms of variable airflow obstruction and in the absence of an alternative diagnosis (see definitions below). The presence of other atopic conditions (e.g., eczema, food allergy, allergic rhinitis) in the child or family members should also be assessed when asthma is suspected.

Spirometry: This is the preferred lung function test to diagnose asthma by assessing for airflow obstruction and its reversibility.[5] The test measures airflow as the ratio of forced expiratory volume in 1 second (FEV_1), which is the volume of air exhaled during the first second of the forced vital capacity (FVC) measurement, and FVC, which is the volume of air forcibly exhaled from the point of maximal inspiration. Results are presented as a percentage of the predicted value or as an absolute value, for each volume, to be compared with the lower limit of normal (LLN). The FEV_1/FVC ratio is calculated from absolute values. Reference values to interpret the test are generally based on age, sex, and height.

Traditionally, race has also been factored into spirometry reference values, on the theoretical basis that biological differences between races influence expected lung function. However, race is a dynamic social construct that encompasses values, structures, and practices, rather than a well-defined biological construct. Furthermore, recent data show that social determinants such as socioeconomic status and education are more strongly correlated with lung function than race.[36] Accordingly, the use of race to set reference values inadvertently normalizes historical socioeconomic and other disadvantages suffered by people from racialized groups, which can perpetuate and amplify race-based inequities and structural racism. To address this issue, the ATS has developed a consensus statement, endorsed by the ERS, that concludes that race and ethnicity should no longer be

considered factors in interpreting the results of spirometry.[3] Rather, a race- and ethnicity-neutral approach to interpreting spirometry, using average reference equations (e.g., the Global Lung Function Initiative average equation), promotes health equity and minimizes negative impacts on people from racialized groups.[3,36,37] The CTS, the ATS, and other respiratory care societies have collaboratively conducted a comprehensive evidence review, explored the clinical implications of using race and ethnicity in the interpretation of pulmonary function testing, and identified a number of research gaps in this area, suggesting that ongoing research is needed to mature our understanding of the implications of this change in reference values for people from racialized groups.[38]

Spirometry should be performed before and after the administration of an inhaled bronchodilator. A pre-bronchodilator FEV_1/FVC result less than the LLN (approximately < 0.8–0.9) demonstrates airflow obstruction. A post-bronchodilator increase in FEV_1 or FVC of at least 12% from baseline, or of 10% of the predicted normal FEV_1 or FVC, supports the diagnosis of asthma.[4,39] The new definition of a 10% change in the predicted normal FEV_1 or FVC is the preferred threshold for defining bronchodilator response; however, adopting this change will take time due to required updates to software, equipment, and interpretation algorithms. A CTS position statement on the adoption of this new definition with considerations for the Canadian population is currently under development. A negative spirometry test does not rule out asthma, especially when asthma is controlled, because of the low sensitivity of the test. In such cases, additional lung function testing is required to confirm the diagnosis of asthma. In situations where people cannot perform spirometry, a referral to specialized asthma care may be considered (see quality statement 5).

Other lung function testing: In Ontario, the following tests are recommended to confirm a diagnosis of asthma[5]:

- **Challenge tests** are an alternative method to diagnose asthma when spirometry is negative. They assess for airway hypersensitivity and hyperresponsiveness. Challenge tests are also known as bronchial provocation tests, such as the methacholine challenge test. Methacholine challenge tests should not be performed within several weeks of an active infection. In the presence of ongoing clinical symptoms, a negative methacholine challenge test may be most helpful in ruling out asthma.[40] Bronchodilators should be withheld prior to testing in accordance with their duration of action. If safe to do so, ICS treatment should be withheld for 4 to 8 weeks prior to testing to remove the anti-inflammatory effect on the airways[40]
- **PEF measurement** assesses the presence of airflow variation over the span of 2 weeks. A variation in PEF of greater than 20% supports a diagnosis of asthma in children and adolescents older than 12 years of age
- **FeNO** is present in larger amounts when the airways are inflamed. FeNO testing should be considered as an adjunct test, with levels of ≥ 35 ppb supporting a diagnosis of asthma. A FeNO of < 35 ppb does not rule out asthma. FeNO levels may also be affected (lowered) by smoking or following systemic or ICS treatment[33]

As soon as possible: Spirometry, followed by other lung function testing if spirometry is negative, should be performed to confirm the diagnosis of asthma as soon as possible and within at most

3 months of a person seeking care for their respiratory symptoms. A trial of medication may be considered if testing cannot be reliably or expediently performed, but confirmatory testing should be completed, regardless of the outcome of the therapeutic trial.[5] Similarly, older children and adolescents diagnosed with asthma before 6 years of age without objective testing should be re-evaluated with lung function testing to confirm the diagnosis.

Signs or symptoms of airflow obstruction: These include shortness of breath, chest tightness, wheezing, or cough. The presence of respiratory signs and symptoms should be assessed through a structured clinical history and physical examination, then documented in the medical record.

Respiratory symptoms characteristic of asthma often[11,41]:

- Include more than 1 symptom (i.e., shortness of breath, chest tightness, wheezing, cough)
- Vary in intensity or over time (e.g., worse at night and/or in the early morning)
- Occur frequently (≥ 2 days per week or ≥ 8 days per month)
- Are caused by allergens (e.g., dust mites, pet dander, cockroaches, pollen, mould), irritants (e.g., infections, smoke, fumes, chemicals, exercise, extreme air temperatures, thunderstorms), or other triggers (e.g., rhinitis, sinusitis, gastroesophageal reflux, food and drug reactions, laughter, hormonal changes during adolescence)

Clear improvement in signs and symptoms with asthma medications: A diagnosis of asthma in children and adolescents is best supported by the evidence of bronchodilator response using pre- and post-bronchodilator spirometry in those who can perform the test. Children 1 to 5 years of age typically cannot undergo spirometry, and in this age group, clear improvement – or, ideally, complete resolution – of signs and symptoms can be directly observed and documented by a physician or other trained clinician. A clinical diagnosis of asthma can be confirmed based on an improvement with asthma medications and no clinical suspicion of an alternative diagnosis (see definition below). Clear improvement in signs and symptoms can be observed in children with recurrent (≥ 2) episodes of worsening asthma-like signs and symptoms, based on the following:

- **Wheezing on presentation:** A direct observation of improvement with inhaled bronchodilator (with or without oral corticosteroids) is the preferred method to confirm the diagnosis
- **No wheezing on presentation, with frequent symptoms or any moderate or severe worsening:** Consider a 3-month trial of treatment with a medium daily dose of an ICS with, as needed, a SABA. Clear, consistent improvement in the frequency and severity of symptoms and/or exacerbations is the alternative method to confirm the diagnosis
- **No wheezing on presentation, with infrequent symptoms and mild exacerbations:** Monitor and reassess when the person is symptomatic. Alternatively, a trial of treatment with as-needed SABA is suggested, and a convincing parental report of a rapid and repeatedly observed response to SABA can be used as a weaker diagnostic method

Alternative diagnosis: An alternative diagnosis should be considered in symptomatic children and adolescents who do not show a clear improvement in signs and symptoms with asthma medications and who have normal spirometry and other lung function testing. This includes, but is not limited to, the following:

- Airway abnormalities (e.g., tracheomalacia, bronchomalacia)
- Congenital cardiac conditions (e.g., congenital heart disease)
- Conditions characterized by breathing difficulties (e.g., shortness of breath, hyperventilation, anxiety, shortness of breath on exertion due to poor cardiopulmonary fitness)
- Congenital lung conditions (e.g., cystic fibrosis, primary ciliary dyskinesia)
- Digestive disorders (e.g., gastroesophageal reflux, eosinophilic gastrointestinal disease)
- Infections (e.g., bacterial pneumonia, pertussis, tuberculosis, immune dysfunction)
- Obstructive lung disease (e.g., bronchiectasis)
- Upper respiratory tract infections (e.g., recurrent colds and coughs, rhinovirus)
- Vocal cord dysfunction (e.g., paroxysmal vocal cord function)

If there is ongoing diagnostic uncertainty, a referral to a specialist should be considered (see quality statement 5).

Rationale

In Ontario, spirometry and other lung function testing to diagnose asthma is increasing but not yet routine. According to available administrative health data, about half of people 7 years of age and older receive lung function testing within 1 year prior to or 2.5 years after their incident date to confirm their diagnosis.[42] Most children 6 years of age and older are able to undergo spirometry (the preferred lung function test to diagnose asthma). Every attempt should be made to confirm the diagnosis of asthma with lung function testing, especially if any changes in the child's condition suggest they may be able to undergo testing.

Often, asthma is diagnosed based on symptoms and history, without spirometry or other lung function testing.[17,19] There is a risk of misdiagnosis when reversible airflow obstruction is not confirmed with lung function testing.[17,19] Asthma is commonly misdiagnosed in adolescents presenting with exercise-related symptoms caused by other diseases associated with breathing difficulties or cough.[41] Children and adolescents whose asthma diagnosis is not supported by lung function testing are less likely to receive appropriate medication, and they can be at higher risk of an asthma exacerbation if their asthma is not treated correctly.[10]

In children 1 to 5 years of age with recurrent asthma-like symptoms or exacerbations, even if triggered by viral infections, the diagnosis of asthma should be considered.[5] Among these children, diagnosing asthma can be difficult because they are often unable to perform lung function testing and because episodic respiratory symptoms (i.e., wheezing and cough) related to other respiratory diseases are common in this age group.[28,41] The diagnosis of asthma in children in this age group should be based on documentation of observed signs and/or symptoms of airway obstruction and a

consistent clinical response to asthma medications suggesting a clear improvement in signs and symptoms, in the absence of clinical suspicion of an alternative diagnosis.[5,10]

What This Quality Statement Means

For Care Partners of Children and Adolescents Suspected of Having Asthma

If your child is 6 years of age or older and is short of breath, has a tight feeling in their chest, or is wheezing or coughing, your child's clinician should make sure they have lung function testing before diagnosing your child with asthma. Since you might have to wait a while for these tests, your child may need to start taking medication right away to help them breathe. Once your child's test results are available, their primary care clinician will review the results with you.

If your child is younger than 6 years old, they may not be able to do the lung function tests. To find out if they have asthma, your child's clinician will:

- Check their breathing and symptoms
- Prescribe asthma medication to see if it helps
- Check to see if something other than asthma is causing their symptoms

For Clinicians

Administer or order spirometry for children and adolescents 6 years of age and older who are clinically suspected of having asthma to confirm a diagnosis of asthma. Given the low sensitivity of spirometry for the diagnosis of asthma, consider the need for additional lung function testing such as methacholine challenge testing or FeNO testing if spirometry is inconclusive. Testing should occur as soon as possible and ideally be completed within at most 3 months of a person seeking care for their respiratory symptoms. Once results are available, review the results with patients and their care partners. Longer wait times should not deter clinicians from ordering and seeking appropriate lung function testing before confirming a diagnosis of asthma. Document signs and symptoms of variable airflow obstruction obtained from clinical history, physical examinations, and objective measures as the basis for diagnosing asthma.[9]

Typically, children under 6 years of age are unable to perform lung function testing accurately.[12] To confirm a diagnosis of asthma in children 1 to 5 years of age who are unable to undergo spirometry – and for whom you have no clinical suspicion of another diagnosis – observe and document their signs and/or symptoms of airflow obstruction (i.e., shortness of breath, chest tightness, wheezing, and/or cough) and clear improvements with asthma medications during 2 or more episodes of worsening symptoms with asthma-like signs.

For Organizations and Health Services Planners

Ensure lung function testing is locally available and accessible for children and adolescents 6 to 15 years of age. Ensure clinicians in primary care and community-based settings are aware of the local availability of lung function testing[9] and can order appropriate lung function testing for children and adolescents clinically suspected of having asthma, including spirometry, FeNO testing, and challenge

tests, without first referring to specialized asthma care. Ensure local availability of FeNO testing for use in conjunction with spirometry.[35] Ensure spirometry is performed within a quality assurance program by trained clinicians.[9,13] Ensure primary care clinicians have the knowledge and skills to clinically diagnose asthma in children 1 to 5 years of age.

Quality Indicators: How to Measure Improvement for This Statement

- Percentage of children and adolescents ≥ 6 to ≤ 15 years of age clinically suspected of having asthma who complete lung function testing within 3 months of seeking care for their respiratory symptoms
- Percentage of children ≥ 1 to ≤ 5 years of age clinically suspected of having asthma whose diagnosis of asthma is confirmed after the documentation of signs or symptoms of airflow obstruction and clear improvement of those signs or symptoms with asthma medication
- Local availability of lung function testing

Measurement details for these indicators, as well as overarching indicators to measure improvement for the goals of the entire quality standard, are available in the technical specifications.

Quality Statement 2: Asthma Control and Risk of Exacerbations

Children and adolescents with asthma have a structured assessment at least annually to determine their level of asthma control, reasons for poor control, and risk of future exacerbations.

Sources: British Thoracic Society, National Institute for Health and Care Excellence, and Scottish Intercollegiate Guidelines Network, 2024[9] | Canadian Thoracic Society, 2021a[5], 2021b[6] | National Heart, Lung, and Blood Institute and National Institutes of Health, 2020[34] | Ontario Health, 2024[35] | Registered Nurses' Association of Ontario, 2004[12]

Definitions

Structured assessment to determine level of asthma control: Asthma control parameters for children and adolescents include measures of symptoms and lung function.

Symptom control

Symptom control over the previous 4 weeks should be assessed at least annually using validated symptom-control questionnaires and tools (e.g., the Asthma Quiz for Kidz,[43] ACT,[11] ACQ[44]) to evaluate the following criteria[5]:

- Daytime symptoms (target ≤ 2 days per week for children 6 years of age and older; < 2 days per week for children under 6 years of age)
- Nighttime symptoms (target < 1 night per week, and mild symptoms)
- Frequency of need for rescue or reliever medication (target ≤ 2 doses per week for children 6 years of age and older; < 2 days per week for children under 6 years of age)
- Physical activity (target normal)
- Absence from work or school due to asthma (target none)

Frequency and severity of exacerbations (target infrequent and mild) should be assessed since the last health care encounter in which they were assessed.[5,45]

Lung function

For children 6 years of age and older, lung function should be assessed with spirometry and other lung function testing as needed (1) at the start of treatment; (2) after 3 to 6 months of treatment to identify and document response to treatment and the person's personal best FEV_1; and (3) annually for the ongoing assessment of asthma control and risk of exacerbation.[11] It is very common to

observe normal lung function in children between exacerbations. Those who have good symptom control with persistent abnormal lung function should be referred to specialized pediatric asthma care.[46] The following measures of lung function should be assessed:

- FEV_1 (target ≥ 90% of personal best)
- If spirometry is unavailable, PEF diurnal variation can be used for children and adolescents 12 years of age and older (target < 10%–15%)[5]

Based on current evidence and technology, FeNO testing is not recommended to monitor asthma control and risk of exacerbations.[5,9,35]

At least annually: Symptom control and any reasons for poor control should be assessed at least annually using a structured assessment, and in some cases more frequently: (1) at every asthma-related health care encounter; (2) after a severe exacerbation of symptoms; (3) when there is a change in treatment; (4) when a pattern of SABA overuse is detected within a year (defined as > 2 SABA inhalers used in 1 year)[5]; (5) prior to or within a season when the patient's asthma would be most symptomatic (i.e., when they are likely to face increased exposure to viral infections and allergens); and (6) when there are complex health needs. In some cases, a phone or virtual health care encounter may be sufficient to assess asthma symptom control. Lung function should be assessed at least annually as described above.

Reasons for poor control: Clinicians should explore the following reasons for poor control, as these factors can increase the risk of more severe asthma exacerbations and contribute to poor quality of life:

- Inadequate controller medication adherence (e.g., ICS underuse due to side effects, attitudes and goals for asthma treatment, affordability)
- Incorrect inhaler technique
- Exposure to allergic triggers and irritants (e.g., colds, cigarette or wildfire smoke, electronic cigarette vapours, inhaled cannabis, perfumes or scents, chemicals)
- Symptomatic comorbidities (e.g., rhinitis, chronic rhinosinusitis, gastroesophageal reflux, obesity, obstructive sleep apnea, depression, anxiety)[5,11]
- Impacts of social determinants of health and the challenges with accessing supports to address these impacts (e.g., education, employment, ethnicity and culture, family and social support, housing, geographic location, income, transportation, and access to care)

Risk of future exacerbations: People with any of the following risk factors are at significantly higher risk for an exacerbation of asthma[5,6,11]:

- History of a previous severe asthma exacerbation requiring systemic steroids, an emergency department visit, and/or hospitalization
- Uncontrolled asthma

- SABA overuse (use of > 2 inhalers in 1 year)
- Current smoking or vaping

Rationale

Asthma control and risk of future exacerbations should be assessed at least annually in primary care.[5,6,9] Assessing control is an important gap in care for people with asthma. A longitudinal audit of primary care practice in Ontario in 2012 and 2013 found that only 15% of patients (16 years of age and older) had had an assessment to determine their level of asthma control at least once during the study period.[47] Clinicians assessed asthma symptom control with at least 1 question from guideline recommendations in only 6% of visits (261 of 4,122 visits). Among these visits, they asked 1.6 of a recommended 5 questions, on average. They asked about daytime symptoms in 61% of visits with any asthma control assessment; frequency of need for reliever medication (45%); nighttime symptoms (27%); physical activity limitations (23%); and school or work absenteeism (4%). All 5 questions were asked in only 1.5% (n = 4) of these visits.[47]

In addition, there is a widening gap between current practice and the recommended annual assessment of lung function (see definition in this statement). The percentage of people with asthma (6 years of age and older) who received asthma-related care and had lung function testing within that same year decreased by more than half in Ontario, from 10.3% in 2000/01 to 4.5% in 2022/23.[42] (Data for fiscal year 2022/23 may be incomplete due to the 2-year algorithm to identify asthma, which means that numbers are subject to change. In addition, due to the observed underutilization of health care services during the COVID-19 pandemic beginning in 2020/21, data captured during this time period may be underestimated.)

Besides high rates of emergency department care and hospitalization, uncontrolled asthma in childhood is also associated with decreased cardiovascular fitness, missed school days, and lower health-related quality of life.[28] However, many reasons for poor control are modifiable, as uncontrolled asthma is most commonly associated with nonadherence to medication, incorrect inhaler technique, lack of an objective diagnosis (see quality statement 1), and poor management of comorbidities.[5,6] These and other reasons for poor control can be identified and addressed to help children and adolescents achieve and maintain asthma control. Children and adolescents identified as potentially having uncontrolled asthma should also have their symptom severity accurately assessed, followed by the appropriate referral (e.g., to urgent care, a follow-up appointment, or specialized asthma care, including allergy testing [see quality statement 5]).[5,12]

What This Quality Statement Means

For Care Partners of Children and Adolescents With Asthma

A clinician should see your child at least annually to check on their asthma. If your child has a severe flare-up or a change in their medication, their clinician may need to see them more often. At these appointments, they should explain how your child can expect to feel when their asthma is controlled, and they should ask you and your child about:

- Their asthma symptoms and what makes them worse
- Their use of medications
- Anything else that might be affecting how they feel

You can help by keeping track of these details between appointments.

For Clinicians

Inform patients they can expect to live symptom free when asthma is controlled. Assess asthma symptom control according to recommended criteria regularly, and at least annually. The structured assessment should determine the person's level of asthma symptom control, any reasons for poor control, and risk of future exacerbations so they can be addressed before modifying medication (see quality statement 3). Whenever possible, ensure spirometry and other lung function testing as needed are done as described above.

Asthma can occur for the first time in adolescence (commonly around the start of menstruation), or worsen or improve, amidst the rapid physical, emotional, cognitive, and social changes in this period. As a result, close monitoring is necessary so that medication can be adjusted to maintain asthma control at the lowest effective doses.[41]

For Organizations and Health Services Planners

Ensure people with asthma are informed that they can expect to live symptom free when their asthma is controlled. Ensure training, systems, processes, and resources are in place in primary care and community-based settings for clinicians to – at least annually and according to recommended criteria – assess asthma symptom control, reasons for poor control, and risk of future exacerbations. Ensure the local availability and accessibility of lung function testing to monitor asthma control.

Quality Indicators: How to Measure Improvement for This Statement

- Percentage of children and adolescents with asthma who had a structured assessment in the previous 6 months
- Percentage of children and adolescents ≥ 6 to ≤ 15 years of age with asthma who completed a lung function test in the previous 12 months

Measurement details for these indicators, as well as overarching indicators to measure improvement for the goals of the entire quality standard, are available in the technical specifications.

Quality Statement 3: Asthma Medication

Children and adolescents with asthma receive appropriate medication and devices based on their age, current level of asthma control, and risk of future exacerbations, including early initiation of regular inhaled anti-inflammatory therapy.

Sources: British Thoracic Society, National Institute for Health and Care Excellence, and Scottish Intercollegiate Guidelines Network, 2024[9] | Canadian Thoracic Society, 2021a[5], 2021b[6]

Definitions

Appropriate medication and devices: All children and adolescents with a confirmed diagnosis of asthma should be offered medication based on their age and current level of asthma control and the most appropriate inhaler devices and spacer device to meet their needs and developmental level. (A spacer device is a long tube with a valve that can be attached to MDIs to make it easier to inhale the medication.) Lower carbon footprint inhalers (e.g., DPI) containing medications with comparable efficacy should be considered where available.[7,8] A shared decision-making approach that considers the safety, cost, and environmental benefits of alternatives to greenhouse gas–intensive MDIs, as well as the patient's inhalation technique and the inspiratory flow rate or pressure required for adequate medication delivery, should be adopted. Children should be switched to a spacer with a mouth piece as soon as they are developmentally able (e.g., at 4 years of age or older).[12] Inhaler technique should be assessed (e.g., using the IDAT)[48] to identify changing needs as children and adolescents grow and develop.[12]

Children and adolescents with 1 or more criteria of uncontrolled asthma should have their medication escalated to help them gain control only after addressing other reasons for poor control (e.g., by counselling on elimination of tobacco and cannabis smoke exposure, smoking prevention or cessation, and allergen avoidance or immunotherapy [if indicated]). Reasons for poor control include, but are not limited to, symptoms of comorbid conditions, trigger exposures (e.g., colds, allergens, cigarette smoke, electronic cigarette vapours), incorrect inhaler technique, and overreliance on rescue or reliever medication with inadequate or intermittent use of controller medication.

Intermittent use of low- or medium-dose inhaled steroids only during virally triggered exacerbations in children and adolescents is not recommended owing to a lack of evidence of this strategy as the best method to maintain asthma control.[5] If asthma remains uncontrolled after escalation to regular (daily) medium-dose ICS for children 1 to 11 years of age, or regular medium-dose ICS with a LABA or ICS with an LTRA for adolescents 12 years of age and older, consultation with or referral to specialized pediatric asthma care should be considered.[5]

Once the child or adolescent with asthma has achieved control with at least 3 months of controller medication, medication should be reduced to the lowest effective dose required to maintain asthma control, prevent future exacerbations, and minimize side effects.

Medication should be offered, escalated, and de-escalated as follows:

Children 1 to 5 years of age

- **Step 1:** Children with mild, infrequent symptoms (< 8 days per month) and no or mild exacerbations (i.e., no rescue oral corticosteroids, no emergency department visit or hospitalization, no exacerbations lasting hours to a few days) should be offered an as-needed reliever medication in the form of a SABA[5]
- **Step 2:** Children with persistent symptoms (≥ 8 days per month) or moderate to severe exacerbations (i.e., worsening symptoms while on SABA alone and requiring oral corticosteroids, an emergency department visit or hospitalization) should be offered regular (daily) inhaled anti-inflammatory medication in the form of a low-dose ICS with as-needed SABA reliever medication[5]
- **Step 3:** If response is inadequate with daily low-dose ICS, children should be offered a medium-dose ICS with as-needed SABA reliever medication. If response remains inadequate, consider an LTRA, also known as montelukast, in addition to the medium-dose ICS. Give the LTRA for a trial period of 8 to 12 weeks (unless there are side effects), then stop if it is ineffective.[9] A referral to specialized pediatric asthma care should be considered if response remains inadequate

Children 6 to 11 years of age

- **Step 1:** Children who experience symptoms less than 2 times per week and have no risk factors for exacerbations may use an as-needed inhaled short-acting reliever medication in the form of a SABA[5,6]
- **Step 2:** Children who experience daytime symptoms 2 or more times per week or meet other criteria for uncontrolled asthma should be offered regular (daily) inhaled anti-inflammatory medication in the form of a low-dose ICS with as-needed SABA reliever medication.[5,6] Daily use of an oral anti-inflammatory medication in the form of an LTRA with as-needed SABA reliever medication is a less effective second-line step 2 therapy[49]
- **Step 3:** Children with uncontrolled asthma who are already using daily inhaled anti-inflammatory treatment in the form of a low-dose ICS should be offered a daily medium-dose ICS with as-needed SABA reliever medication.[5,6] A referral to specialized pediatric asthma care should be considered if response remains inadequate
- **Step 4:** If response is inadequate with daily medium-dose ICS, children should be offered 1 of 2 options in (or in consultation with) a specialized pediatric asthma care setting: (1) switch to daily combined inhaled anti-inflammatory and long-acting reliever medications in the form of a medium-dose ICS with a LABA; or (2) keep taking a medium-dose ICS and add a daily oral anti-inflammatory medication in the form of an LTRA

Adolescents 12 years of age and older

- **Step 1:** Adolescents who experience symptoms less than 2 times per week, have otherwise well-controlled asthma, and have no risk factors for exacerbations may use as-needed inhaled short-acting reliever medication in the form of a SABA[5,6]
- **Step 2:** Adolescents who experience symptoms 2 or more times per week or meet other criteria for uncontrolled asthma should be offered regular (daily) inhaled anti-inflammatory medication in the form of a low-dose ICS with as-needed SABA reliever medication.[5,6,9,50] As-needed bud/form may be an alternative option to low-dose ICS with as-needed SABA for adolescents who experience difficulties adhering to daily low-dose ICS despite self-management education and support.[6] Daily use of an oral anti-inflammatory medication in the form of an LTRA with as-needed SABA reliever medication is a second-line step 2 therapy[5,6]
    - For adolescents who have well-controlled asthma but have a significantly higher risk of exacerbation, as-needed bud/form is considered an equivalent alternative to a low-dose ICS with as-needed SABA reliever medication for first-line therapy at this step[6]
- **Step 3:** Adolescents who have uncontrolled asthma while using a daily inhaled anti-inflammatory medication in the form of a low-dose ICS should be offered daily combined inhaled anti-inflammatory and long-acting reliever medication at a low dose (i.e., an ICS/LABA) with as-needed SABA reliever medication. Those who have uncontrolled asthma while using as-needed bud/form may similarly be switched to daily use of this medication. Second-line step 3 therapies include continuing to take daily low-dose ICS and adding a daily LTRA, or escalating to a medium-dose ICS[5,6]
- **Step 4:** Adolescents who have uncontrolled asthma while using a daily combined inhaled anti-inflammatory and long-acting reliever medication in the form of low-dose ICS/LABA should be offered daily medium-dose ICS/LABA with as-needed SABA, or can be switched to bud/form maintenance and reliever therapy at the same maintenance ICS dose. Second-line step 4 therapies include continuing to take daily low-dose ICS/LABA and adding a daily LTRA or continuing to take a daily low-dose ICS/LABA and adding daily tiotropium[5,6]
- **Step 5:** Adolescents who have uncontrolled asthma while using daily step 4 medications should be offered daily high-dose ICS/LABA (with as-needed SABA or bud/form used as a reliever medication) and should be referred to specialized pediatric asthma care, as a specialist may prescribe life-altering medications known as biologics (see quality statement 5)[5,6]

Medication de-escalation can be attempted once the child or adolescent with asthma has achieved control for at least 3 to 6 months.

Children and adolescents, including younger children, with clinically suspected asthma that has not yet been confirmed with lung function testing may be prescribed a trial of therapy if testing cannot be

reliably or expediently performed, but confirmatory testing should still be completed as soon as possible, regardless of the outcome of the therapeutic trial (see quality statement 1).[5]

Asthma control: Parameters include measures of symptoms and lung function, as described in quality statement 2.

Risk of future exacerbations: This includes patient-specific risk factors as described in quality statement 2.

Rationale

Asthma management aims to control the disease and, by doing so, prevent or minimize the risk of short- and long-term complications and death.[5] Because uncontrolled asthma is most commonly associated with overreliance on rescue or reliever medication and inadequate use of controller medication, care delivery that follows guideline recommendations for medication escalation can help to improve asthma control.

However, appropriate medication as a component of asthma management often depends on other key components of high-quality asthma care, such as regular assessment of asthma control, reasons for poor control, and risk of future exacerbations (see quality statement 2) and the use of asthma action plans along with asthma education (see quality statement 4).[11] Therefore, discussions about appropriate medication and devices – between the person with asthma, their care partner(s), and their clinician – should promote patient empowerment, shared decision-making, and self-management. This can include discussions of the patient's and their care partners' preferences, such as goals, beliefs, and concerns about asthma and medications; their preferences for strategies to achieve control and to reduce the risk of asthma exacerbations (while considering individual characteristics or phenotype); and practical issues, such as inhaler technique, controller medication adherence, and the affordability of medications.[11] Factors that change in importance as children get older may influence the type of medication and inhaler device prescribed; these factors include convenience, affordability, ease of device use, portability, stigma of having asthma, peer influence, and personal or cultural preference for a specific device. Adolescents are at particularly high risk for uncontrolled asthma if they have difficulty accepting the need to take controller medications.[12]

The need for increased knowledge among prescribers about optimal escalation and tapering of asthma medication continues to be an important part of appropriate prescribing. Despite recommendations for the early initiation of inhaled anti-inflammatory therapy and for escalating or tapering the inhaled anti-inflammatory medication based on patients' asthma control level, a longitudinal primary care practice audit in Ontario found large gaps in asthma medication for adults with asthma.[47] Similar gaps are likely in the care of children and adolescents with asthma.

What This Quality Statement Means

For Care Partners of Children and Adolescents With Asthma

Most people with asthma can live symptom free by regularly using their controller puffer and by avoiding triggers as much as possible. Your child's clinician should work with you and your child to decide what asthma medication and devices would work best for your child. They should:

- Explain when your child should use their puffers and show you and your child how to use them
- Ask you or your child to show them how to use their puffers to make sure you and your child are confident using them

There are many different types of asthma medication. If your child continues to have asthma symptoms while on their current medications, talk with their primary care clinician or other clinician about trying a different dose or a different asthma medication. When you fill prescriptions, the pharmacist will teach you and your child how to use the medication and answer any questions you have. It is important for your child to take their controller medication every day if their primary care clinician has prescribed it this way.

Your child should always carry their rescue inhaler with them. Talk to their teachers, other educators, and school or day care staff about your child's asthma and the medication they need.

For Clinicians

Prescribe medications based on the person's level of asthma control and risk of future exacerbations, and prescribe a spacer if any medications are delivered via MDI. Escalate medication according to the steps described in this statement's definitions, only after addressing other reasons for poor control (see quality statement 2).[5,6] Initiate a low-dose ICS as a regular controller medication for children and adolescents 1 to 16 years of age with a confirmed diagnosis of asthma who experience asthma symptoms 2 or more times per week or meet other criteria for uncontrolled asthma.[5,6] Children 12 years of age and older who experience difficulties adhering to daily low-dose ICS despite self-management education and support may be prescribed as-needed bud/form as an alternative. For adolescents who have well-controlled asthma but have a significantly higher risk of future exacerbations, as-needed bud/form is considered an equivalent alternative to a low-dose ICS with as-needed SABA reliever medication for first-line therapy.

When prescribing or dispensing asthma medication, provide clear instructions about when and how to properly use the medication and its delivery system. Teach proper inhaler technique and use of a spacer device whenever an MDI is prescribed, and ask people to demonstrate how they use their inhaler to ensure proper technique. (This patient education technique is called "teach back."). A validated point-of-care conversation aid, such as the Asthma Decision Aid, can be used with patients 12 years of age and older with mild asthma and their care partners to support shared decision-making when selecting between daily low-dose ICS and as needed bud/form.

For Organizations and Health Services Planners

Ensure training, systems, processes, and resources are in place in primary care and community-based settings for clinicians to prescribe appropriate medication and devices based on the level of asthma control. Ensure care partners of children and adolescents with asthma can access and afford the most appropriate medication and devices for their child.

Quality Indicators: How to Measure Improvement for This Statement

- Percentage of children and adolescents with asthma with 1 or more appropriate indications who are prescribed regular (daily) inhaled anti-inflammatory therapy
- Percentage of children and adolescents with uncontrolled asthma who have had all their reasons for poor control addressed
- Percentage of children and adolescents with uncontrolled asthma who have their medication escalated after other reasons for poor control have been addressed

Measurement details for these indicators, as well as overarching indicators to measure improvement for the goals of the entire quality standard, are available in the technical specifications.

Quality Statement 4: Self-Management Education and Asthma Action Plan

Children and adolescents with asthma and their care partners receive asthma self-management education and a written personalized asthma action plan that is reviewed regularly with a clinician.

Sources: British Thoracic Society, National Institute for Health and Care Excellence, and Scottish Intercollegiate Guidelines Network, 2024[9] | Canadian Thoracic Society, 2021a[5] | Registered Nurses' Association of Ontario, 2004[12]

Definitions

Self-management education: This is tailored to the person's learning needs and provided by a trained clinician. It should include information and support related to the following issues[13]:

- Medication adherence (e.g., side effects, attitudes and goals for asthma treatment, affordability)
- Medication delivery device and inhaler technique
- Identification and avoidance or reduction of exposure to allergic and irritant triggers (e.g., pet dander, mould, colds, smoke, air pollution, extreme air temperatures, chemicals, perfumes or scents)
- Smoking prevention and cessation for the person with asthma and other people in their household (e.g., vaping, tobacco, cannabis)
- Impact of comorbidities on asthma symptoms and importance of management of comorbidities (e.g., rhinitis, chronic rhinosinusitis, gastroesophageal reflux, obesity, obstructive sleep apnea, depression, anxiety)[5,11]
- Education for older children and adolescents to take independent responsibility for managing as much of their asthma care as they are able to, and support for care partners to gradually hand over responsibility for management to their child
- Use of peak flow meters when indicated for children 12 years of age and older

To ensure people are empowered to self-manage their asthma, clinicians who provide self-management education and supports should consider the social determinants of health and the person's circumstances (e.g., education, employment, ethnicity and culture, family and social support, housing, geographic location, income, transportation, and access to care). Self-management education may be provided in-person or virtually, and can be further supported using computerized

decision support systems adapted for patient use such as the Electronic Asthma Management System (eAMS).[9]

Asthma action plan: A written personalized asthma action plan (sometimes referred to as an AAP) is provided alongside self-management education. It typically uses 3 "zones" (similar to traffic light colours: green, yellow, and red) to describe the level of asthma control. It is a collaboratively written set of instructions that is explained and provided to the person with asthma and/or their care partner(s) to assist them with the following:

- How to assess asthma control (self-monitoring)
- How to maintain good control and prevent asthma exacerbations by regularly using controller medication
- How to identify signs, symptoms, and/or peak flow rate indicating uncontrolled asthma
- What to do during periods of uncontrolled asthma, such as adding medications or increasing the dose of medication; how much medication to take and for how long; and when and how to seek help (e.g., when to call their clinician or go to the hospital)

Reviewed regularly: The written personalized asthma action plan should be reviewed at every asthma-related health care encounter, after a severe exacerbation of symptoms, when there is a change in the person's level of asthma control or a change in treatment, or at least annually.

Clinician: Many types of clinicians may be involved in providing and reviewing asthma action plans and providing self-management education. Asthma action plans can be provided by primary care clinicians, such as family doctors or nurse practitioners, or by respirologists, pediatricians, allergists, and other physicians. In addition, nurses, respiratory therapists, pharmacists, and other clinicians who are CREs or CAEs can review asthma action plans and provide self-management education.

Rationale

Providing self-management education on inhaler technique, along with written personalized asthma action plans that reinforce understanding of medication and are regularly reviewed by a clinician, can significantly improve people's asthma management and their health outcomes.[5,16,51] In practice currently, self-management education remains poorly implemented and patients rarely receive written asthma action plans.[16,52] For example, in a 2004 survey, only 22% of Canadian physicians reported consistently providing written asthma action plans, while just 11% of patients reported receiving one.[16] In a primary care chart review in Alberta, only 2% of patients had an asthma action plan.[53]

Older children and adolescents with asthma should be prepared, educated, and empowered by their clinicians to take responsibility for managing as much of their asthma care as they are able to, and care partners should be supported to gradually hand over responsibility to their child.

What This Quality Statement Means

For Care Partners of Children and Adolescents With Asthma

Your child's clinician should help you and your child learn how to manage their asthma. They should work with you and your child to create an asthma action plan. This plan describes:

- Your child's medications and how to take them
- Things your child can do each day to stay healthy
- What to do if your child's symptoms flare up

You can share a copy of your child's asthma action plan with any of their other clinicians and their school or day care.

For Clinicians

When prescribing medication, provide asthma self-management education to children and adolescents with asthma and their care partners, and work with them to create a written personalized asthma action plan that considers literacy, usability, and language. Ensure they receive information about and referrals to local service providers who can help them learn how to avoid or reduce exposure to triggers and improve their ability to self-manage (e.g., referral to asthma education, team-based care, or social services).

When dispensing medication for children and adolescents with asthma, ensure it aligns with their asthma action plan and review the plan with them and/or their care partners.

For Organizations and Health Services Planners

Ensure training, systems, processes, and resources are in place in primary care and community-based settings for clinicians to provide and review self-management education and asthma action plans with children and adolescents with asthma and their care partners. Ensure children and adolescents with asthma and their care partners have access to clinicians trained in providing asthma self-management education and asthma action plans, including, but not limited to, respiratory therapists and other clinicians who are CREs or CAEs.

Quality Indicators: How to Measure Improvement for This Statement

- Percentage of children and adolescents with asthma who have ever received asthma self-management education from a trained clinician
- Percentage of children and adolescents with asthma who have received a written personalized asthma action plan

- Percentage of children and adolescents with asthma who have a written personalized asthma action plan and who have had their asthma action plan reviewed in the previous 12 months

Measurement details for these indicators, as well as overarching indicators to measure improvement for the goals of the entire quality standard, are available in the technical specifications.

Quality Statement 5: Referral to Specialized Pediatric Asthma Care

Children and adolescents with asthma with appropriate indications are referred to specialized pediatric asthma care.

Sources: British Thoracic Society, National Institute for Health and Care Excellence, and Scottish Intercollegiate Guidelines Network, 2024[9] | Canadian Thoracic Society, 2021a[5] | European Respiratory Society, 2021[33]

Definitions

Appropriate indications: A referral to specialized pediatric asthma care for children and adolescents may be considered for any of the following reasons:

- The person's inability to complete lung function testing
- Diagnostic uncertainty (e.g., having obstructive spirometry but negative bronchodilator reversibility, symptoms suggestive of asthma but negative spirometry and negative peak flow variability)[33]
- Persistent abnormal lung function testing results despite good symptom control
- Suspected comorbidity or alternative diagnosis that requires specialist care
- Lack of response to an escalation of controller medication (e.g., frequent symptoms [≥ 8 days per month] despite a daily medium-dose of ICS [200–250 mcg for children 1 to 5 years of age, 201–400 mcg for children 6 to 11 years of age, or 251–500 mcg for children and adolescents 12 years of age and over] with correct inhaler technique and appropriate medication adherence)[5,11]
- Any hospitalization, ≥ 2 exacerbations requiring oral corticosteroids, or emergency department visits within a 12-month period[5,9]
- Suspicion or recognition of severe asthma (i.e., symptoms requiring treatment with high-dose ICS [> 400 mcg per day for children 6 to 11 years of age or > 500 mcg per day for children 12 years of age and over] and the use of a second controller for the previous year or the need for daily maintenance oral corticosteroid)
- Life-threatening event such as an admission to the intensive care unit
- Suspected side effects of treatment (e.g., adrenal suppression, continuous reduction in growth velocity after 1 to 2 years of ICS treatment)[11]
- Poor understanding of asthma self-management (by the person with asthma or their care partner)

- Need for allergy testing to assess the possible role of environmental allergens
- Other considerations such as parental anxiety, the need for reassurance, or the need for additional education

Specialized pediatric asthma care: Depending on the clinical indication, 1 or more of the following professionals may provide specialized pediatric asthma care:

- A pediatric respirologist
- An allergist
- A pediatrician with expertise in asthma
- A clinician with expertise in pediatric asthma and/or working within a specialized pediatric asthma clinic, such as a family physician, a nurse practitioner, a nurse, a respiratory therapist, or another clinician who is a CRE or CAE

Rationale

Most children and adolescents with asthma can effectively manage their asthma with medication, self-management education, and support from primary care. However, in some clinical situations, a referral to specialized pediatric asthma care may be needed for expert advice regarding diagnosis and/or management.[5,11] A study examining factors associated with having seen an asthma specialist among children and adolescents (0 to 17 years of age) visiting the emergency department for their asthma found that self-management was poorer among those who had not seen a specialist.[54] Particularly, these patients' parents reported that their children underused asthma controller medications (24% versus 64% among those who had seen a specialist) and asthma action plans (20% versus 62%).[54]

In Ontario, children and adolescents, including younger children, may need to be referred to specialized care within a regional pediatric asthma centre or a primary care asthma program site to confirm a diagnosis of asthma and/or for further self-management education.[5,55] To promote patient-centred care, the referral process should involve an integrated approach in which there is collaboration, communication, and shared decision-making among clinicians, the person with asthma, and their care partners.

A recent chart audit of a convenience sample of primary care clinics in Ontario highlighted that wait times (the duration between a patient's referral and their specialist visit) vary across clinical specialties (median of 79 days for nonurgent referrals and 49 days for urgent referrals).[56] Electronic tools for specialist consultation such as eConsult or virtual visits can be used to improve wait times for specialized pediatric asthma care.

What This Quality Statement Means

For Care Partners of Children and Adolescents With Asthma

If your child takes their medication and avoids triggers as much as possible but continues to have asthma symptoms, or if their primary care clinician has other concerns, they should consult with or refer your child to someone who specializes in asthma care for children.

For Clinicians

Ensure children and adolescents with asthma are referred to specialized pediatric asthma care if there are appropriate indications (see definition in this statement). After seeing the patient, the specialized pediatric asthma care clinician should communicate the recommended plan for treatment and follow-up (if needed) to the primary care clinician. In some cases, a consultation between the primary care clinician and specialized pediatric asthma care clinician may be required or sufficient; that is, the patient may not need to visit the specialized clinician.

All clinicians involved should ensure the entire referral process involves collaboration, communication, and shared decision-making among clinicians, the person with asthma, and their care partners.

For Organizations and Health Services Planners

Ensure systems, processes, and resources are in place so all children and adolescents with asthma have timely access to specialized pediatric asthma care when needed upon referral from their primary care clinician, including the use of eReferral, eConsult, and virtual visits. Ensure clinicians in primary care and community-based care are aware of the asthma services and referral processes in their communities.[13]

Quality Indicators: How to Measure Improvement for This Statement

- Percentage of children and adolescents with 1 or more appropriate indications who are referred to specialized pediatric asthma care
- Percentage of children and adolescents with asthma who have 2 or more asthma-specific emergency department visits or 1 or more asthma-specific hospitalizations and who then have a consultation with a relevant specialist clinician within 3 months of the index event

Measurement details for these indicators, as well as overarching indicators to measure improvement for the goals of the entire quality standard, are available in the technical specifications.

Quality Statement 6: Follow-Up After Discharge

Children and adolescents who have had an emergency department visit or been hospitalized for an asthma exacerbation have a follow-up assessment within 2 to 7 days after discharge.

Source: Advisory committee consensus

Definitions

Asthma exacerbation: This can occur in people with a pre-existing diagnosis of asthma (even when mild or well controlled) or, occasionally, as the first presentation of asthma. It is an episode characterized by a progressive worsening in symptoms of shortness of breath, cough, wheezing, or chest tightness, and a progressive decrease in lung function. Asthma exacerbations represent a big enough change from the person's usual status to require a change in treatment (e.g., the use of oral corticosteroids), an emergency department visit, or hospitalization. Exacerbations often occur in response to irritant or allergic trigger exposures (e.g., viral, bacterial, or fungal infection in the upper or lower respiratory tract, air pollution, smoke, pollen) and/or inadequate controller medication adherence. However, a subset of people present with exacerbations without trigger exposures.

Follow-up assessment: Children and adolescents should be assessed in primary care or an asthma clinic within 2 to 7 days of an emergency department visit or hospital discharge and reassessed regularly over subsequent weeks until they achieve asthma control and reach or surpass their personal best lung function (see quality statement 2). The initial follow-up may be completed by primary care clinicians, such as family doctors or nurse practitioners, or by respirologists, allergists, and other physicians or other members of the care team, such as nurses, respiratory therapists, and pharmacists who are CREs or CAEs. In some cases, a phone or virtual follow-up may be sufficient.[11]

The follow-up assessment should be individualized and related to the details of the emergency department visit or hospitalization. Components of the follow-up assessment include, but are not limited to, a review of the following:

- The person's or their care partners' understanding of the cause of their asthma exacerbation
- Asthma control, reasons for poor control, and risk of future exacerbations (see quality statement 2)
- Changes in medication as needed by prescribing primary care clinicians, including discontinuation of oral corticosteroids (see quality statement 3)
- Asthma action plan (see quality statement 4)

- Self-management education, including medication adherence, inhaler technique, and avoidance or reduction of trigger exposures (see quality statement 4)

The follow-up assessment should also include a referral to an asthma education program, and children and adolescents who were hospitalized (particularly if they required treatment in an intensive care unit) should be referred to specialized pediatric asthma care (see quality statement 5).[1,11]

Rationale

Asthma exacerbations can be life-threatening emergencies and may require care in an emergency department or a hospitalization.[11] The subsequent transition from hospital to home can complicate a person's care, as transitions are vulnerable points in the provision of health care.[57] Transitions pose a risk of information being lost or miscommunicated between health care settings, which can increase the person's vulnerability to adverse events.

For children with asthma, the need for an acute care visit should be considered a failure of asthma management, and their transition back to primary care should provide an opportunity to address gaps in care and/or self-management.[5] Gaps in the quality of hospital-based care may also increase vulnerability to adverse events. For example, the Ontario Asthma Regional Variation Study documented important care gaps in Ontario emergency departments, including the underutilization of systemic steroids on discharge (in about 32% of pediatric patients) and failure to refer pediatric patients to specialized asthma services (about 1.8%) or other asthma service (about 2.8%).[58]

Prompt follow-up in primary care or referral to an asthma clinic can mitigate these risks. In some patients with respiratory or chronic illnesses other than asthma, early follow-up has been linked to improved patient outcomes with reduced rates of readmission, emergency department use, and death.[59]

For more information on discharge planning and follow-up in primary care after discharge, please see the quality standard *Transitions Between Hospital and Home*.[60]

What This Quality Statement Means

For Care Partners of Children and Adolescents With Asthma

If your child has gone to the emergency department or been admitted to hospital because of an asthma flare-up, their primary care clinician should follow up with them within 2 to 7 days of leaving the hospital. They will check to see how your child is doing and make any needed changes to their medications and asthma action plan.

In some cases, the initial follow-up may be done by a respirologist, allergist, or another physician, or by other members of the care team, such as nurses, respiratory therapists, and pharmacists who are CREs or CAEs.

At this visit, you can also ask questions to make sure you understand:

- What caused the flare-up
- What care your child received
- What you and your child can do to prevent asthma flare-ups

For Clinicians

Before a child or adolescent who has had an asthma exacerbation is discharged from an emergency department, the care team should tell their care partner to arrange a follow-up primary care appointment. If the person was hospitalized, the hospital care team should arrange for a follow-up assessment in primary care. In either setting, the discharging care team should send the person's discharge information directly to the primary care clinician. Primary care follow-up is important to ensure the person's treatment continues, their asthma symptoms are well controlled, and their lung function reaches their known personal best.

Following discharge, consider referral to an asthma education program or specialized pediatric asthma care.[11]

For Organizations and Health Services Planners

Ensure systems, processes, and resources are in place so all children and adolescents have timely access to follow-up in primary care after an asthma-specific emergency department visit or hospitalization. This includes ensuring all children and adolescents with asthma have a primary care clinician, arrangements for a follow-up assessment in primary care are made, and seamless communication is possible between hospital and primary care settings.

Quality Indicator: How to Measure Improvement for This Statement

- Percentage of children and adolescents who have a follow-up assessment in primary care or in an asthma clinic within 7 days following an emergency department visit or hospitalization for an asthma exacerbation

Measurement details for this indicator, as well as overarching indicators to measure improvement for the goals of the entire quality standard, are available in the technical specifications.

Appendix 1: About This Quality Standard

How to Use This Quality Standard

Quality standards inform patients, clinicians, and organizations about what high-quality care looks like for health conditions or processes deemed a priority for quality improvement in Ontario. They are based on the best evidence.

Guidance on how to use quality standards and their associated resources is included below.

For Care Partners of Children and Adolescents With Asthma

This quality standard consists of quality statements. These describe what high-quality care looks like for children and adolescents with asthma.

Within each quality statement, we have included information on what these statements mean for you as a care partner of a child or adolescent with asthma.

In addition, you may want to download this accompanying patient guide on asthma to help you and your family have informed conversations with your clinicians. Inside, you will find information and questions you may want to ask as you work together to make a plan for your child's or adolescent's care.

For Clinicians and Organizations

The quality statements within this quality standard describe what high-quality care looks like for children and adolescents with asthma. They are based on the best evidence and designed to help you know what to do to reduce gaps and variations in care.

Many clinicians and organizations are already providing high-quality, evidence-based care. However, there may be elements of your care that can be improved. This quality standard can serve as a resource to help you prioritize and measure improvement efforts.

Tools and resources to support you in your quality improvement efforts accompany each quality standard. These resources include indicators and their definitions, available in the technical specifications. Measurement is key to quality improvement. Collecting and using data when implementing a quality standard can help you assess the quality of care you are delivering and identify gaps in care and areas for improvement.

There are also a number of resources online to help you, including:

- Our patient guide on asthma, which you can share with patients and families to help them have conversations with you and their other clinicians. Please make the patient guide available where you provide care

- Our measurement resources, including the technical specifications for the indicators in this quality standard, the "case for improvement" slide deck to help you to share why this standard was created and the data behind it, and our measurement guide containing supplementary information to support the data collection and measurement processes
- Our placemat, which summarizes the quality standard and includes links to helpful resources and tools
- Our *Getting Started Guide*, which includes links to templates and tools to help you put quality standards into practice. This guide shows you how to plan for, implement, and sustain changes in your practice
- Quorum, an online community dedicated to improving the quality of care across Ontario. This is a place where clinicians can share information and support each other, and it includes tools and resources to help you implement the quality statements within each standard

How the Health Care System Can Support Implementation

As you work to implement this quality standard, there may be times when you find it challenging to provide the care outlined due to system-level barriers or gaps. These challenges have been identified and documented as part of the development of the quality standard, which included extensive consultation with clinicians and lived experience advisors and a careful review of available evidence and existing programs. Many of the levers for system change fall within the purview of Ontario Health, and as such we will continue to work to address these barriers to support the implementation of quality standards. We will also engage and support other provincial partners, including the Ministry of Health or other relevant ministries, on policy-level initiatives to help bridge system-level gaps.

In the meantime, there are many actions you can take on your own, so please read the standard and act where you can.

Appendix 2: Glossary

Term	Definition
Care partner	An unpaid person who provides care and support in a nonprofessional capacity, such as a parent, legal guardian, or other legally authorized family member. Other terms commonly used to describe this role include “caregiver,” “family caregiver,” “carer,” and “primary caregiver.”
Children and adolescents	People under 16 years of age.
Clinicians	Regulated professionals who provide care to patients or clients. Examples are nurses, nurse practitioners, occupational therapists, respiratory therapists, pharmacists, physicians, physiotherapists, psychologists, social workers, and speech-language pathologists.
Controller medication	An inhaler or puffer that prevents asthma symptoms by reducing the swelling of the airways in the lungs.
Family	The people closest to a person in terms of knowledge, care, and affection; this may include biological family or family of origin, family through marriage, or family of choice and friends. The person defines their family and who will be involved in their care.
Home	A person’s usual place of residence. This may include personal residences, retirement residences, assisted-living facilities, long-term care facilities, hospices, and shelters.
Prescriber	A physician, nurse practitioner, or dentist who is authorized to prescribe medication.
Primary care	A setting where people receive general health care (e.g., screening, diagnosis, and management) from a clinician who the person can access directly without a referral. This is usually the primary care clinician, family physician, nurse practitioner, or other clinician with the ability to make referrals, request laboratory testing, and prescribe medications.
Primary care clinician	A family physician (also called a primary care physician), pediatrician, or nurse practitioner.
Rescue or reliever medication	An inhaler or puffer that relieves asthma symptoms quickly by opening the airways.
Transitions in care	These occur when patients transfer between different care settings (e.g., hospital, primary care, long-term care, home and community care) or between different clinicians during the course of an acute or chronic illness.

Appendix 3: Values and Guiding Principles

Values That Are the Foundation of This Quality Standard

This quality standard was created, and should be implemented, according to the *Patient, Family and Caregiver Declaration of Values for Ontario*. This declaration "is a vision that articulates a path toward patient partnership across the health care system in Ontario. It describes a set of foundational principles that are considered from the perspective of Ontario patients, and serves as a guidance document for those involved in our health care system."

These values are:

- Respect and dignity
- Empathy and compassion
- Accountability
- Transparency
- Equity and engagement

A quality health system is one that provides good access, experience, and outcomes for all people in Ontario, no matter where they live, what they have, or who they are.

Guiding Principles

In addition to the above values, this quality standard is guided by the principles outlined below.

Acknowledging the Impact of Colonization

Clinicians should acknowledge and work toward addressing the historical and present-day impacts of colonization in the context of the lives of Indigenous Peoples and racialized people throughout Canada. This work involves being sensitive to the impacts of intergenerational and present-day traumas and the physical, mental, emotional, and social harms experienced by Indigenous and racialized people, families, and communities, as well as recognizing their strength and resilience. This quality standard uses existing clinical practice guideline sources that may not include culturally appropriate care or acknowledge traditional beliefs, practices, and models of care relevant to Indigenous and racialized people.

French Language Services

In Ontario, the *French Language Services Act* guarantees an individual's right to receive services in French from Government of Ontario ministries and agencies in 27 designated areas and at government head offices.[61]

Social Determinants of Health

Homelessness and poverty are 2 examples of economic and social conditions that influence people's health, known as the social determinants of health. Other social determinants of health include employment status and working conditions, race and ethnicity, food security and nutrition, gender, housing, immigration status, social exclusion, and residing in a rural or urban area. Social determinants of health can have strong effects on individual and population health; they play an important role in understanding the root causes of poorer health. Children and adolescents with asthma and their care partners should be provided services that are respectful of their gender, sexual orientation, socioeconomic status, housing, age, background (including self-identified cultural, ethnic, and religious background), and disability. Equitable access to the health system also includes access to culturally safe care. Language, a basic tool for communication, is an essential part of safe care and must be considered throughout a person's health care journey. For example, in predominantly English-speaking settings, services should be actively offered in French and other languages.

Chronic Disease Self-Management

Children and adolescents with asthma and their care partners should receive services that are respectful of their rights and dignity and that promote shared decision-making and self-management.[62,63] Further, people should be empowered to make informed choices about the services that best meet their needs.[64,65] Children and adolescents with asthma and their care partners should engage with their clinicians in informed, shared decision-making about their treatment options. Each person is unique and has the right to determine their own path toward health and well-being.[62]

Integrated Care

Children and adolescents with asthma should receive care through an integrated team–based approach that facilitates access to interprofessional services from primary care clinicians, specialized pediatric asthma care, and programs in the community, according to the patient's needs over time.[66] Clinicians should work with patients, their families and care partners, and communities to deliver the highest quality of care.[67] Interprofessional collaboration, shared decision-making, coordination of care across different settings within and beyond the health sector, and continuity of care (including follow-up care) are hallmarks of this patient-centred approach.[66]

Trauma-Informed Care

Trauma-informed care is health care that reflects an understanding of trauma, the impact that traumatic experiences can have on human beings, and the potential to traumatize or retraumatize patients when providing them with care.[68,69] A trauma-informed approach does not necessarily involve addressing the trauma directly. Rather, it involves acknowledging that a person may have experienced a previous traumatic event that may contribute to their current health concerns, and taking steps to reduce opportunities for traumatization (e.g., using active strategies around consent, attending to individual patient needs, recognizing the inherent power imbalance in clinician–patient relationships, and facilitating greater patient agency and choice in all interactions).[70,71] A trauma-informed approach emphasizes the creation of an environment in which a person can feel comfortable disclosing trauma, and it involves understanding, respecting, and responding to the effects of trauma.[69-71]

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About Us

We are an agency created by the Government of Ontario to connect, coordinate, and modernize our province's health care system. We work with partners, providers, and patients to make the health system more efficient so everyone in Ontario has an opportunity for better health and well-being.

Equity, Inclusion, Diversity, and Anti-Racism

Ontario Health is committed to advancing equity, inclusion and diversity and addressing racism in the health care system. As part of this work, Ontario Health has developed an *Equity, Inclusion, Diversity and Anti-Racism Framework*, which builds on existing legislated commitments and relationships and recognizes the need for an intersectional approach.

Unlike the notion of equality, equity is not about sameness of treatment. It denotes fairness and justice in process and in results. Equitable outcomes often require differential treatment and resource redistribution to achieve a level playing field among all individuals and communities. This requires recognizing and addressing barriers to opportunities for all to thrive in our society.

For more information about Ontario Health, visit OntarioHealth.ca.

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