

GUIDELINES & PROTOCOLS

ADVISORY COMMITTEE

Asthma - Diagnosis and Management

Effective Date: May 1, 2005

Scope

This guideline is based on the Canadian Asthma Consensus Report (1999)¹ and the Asthma Guidelines update 2001². It applies to patients age six and older.

Asthma is a syndrome that is characterized by paroxysmal or persistent symptoms such as breathlessness, chest tightness, wheezing, sputum production and cough. It is associated with variable airflow limitation and airway hyperresponsiveness in response to endogenous and exogenous stimuli. Inflammation and its resultant effects on airway structure are considered to be the main mechanisms leading to the development and persistence of asthma.

Standard of care

The literature recommends the following standards for the diagnosis and management of asthma:

- Smoking cessation in the home and workplace is a cornerstone of asthma management
- Confirm diagnosis and assess severity by objective measures of airflow obstruction
- Consider relevant contributing factors (e.g. dust, pet allergens, β -blocker eye drops, reflux esophageal disease, occupational exposure) in light of the person's history.
- Initiate patient/family education, focusing on environmental control and self-management
- Prescribe medication required to achieve control
- Achieve acceptable asthma control
- Develop an action plan in consultation with patient
- Once control is achieved, reduce medications to the minimum dose required to maintain control

Twice a year:

- Review asthma symptoms and degree of control
- Review medication needs and side effects
- Review action plan with patient
- Measure growth in children

RECOMMENDATION 1: Diagnosis of asthma

When asthma is suspected from symptoms and clinical presentation, and other disorders have been considered and ruled out, confirm the diagnosis by objective measures of variable airflow obstruction and assess severity. In most cases, the following criteria would suffice as objective evidence of variable airflow obstruction:

- Spirometry: A 12-15 % or greater improvement in forced expiratory volume (FEV_1) (and >180 ml in adults) from the baseline 15 minutes after use of an inhaled short acting beta 2 agonist; or 20% or greater "spontaneous variability" in spirometry values.
- Serial measures of peak expiratory flow (PEF): A >20% change after administration of a bronchodilator; a 20% change in values over time.

In rare cases the following tests may be used to help in the diagnosis of asthma:

- Methacholine challenge
- Exercise challenge
- Steroid trial: appropriate doses of inhaled steroids for 4-6 weeks or oral steroids for 10-14 days (adult) resulting in >20% improvement in FEV₁.

RECOMMENDATION 2 Patient education and environmental control

Patients should receive adequate education and support so they understand their responsibility for control of asthma. Education on environmental control, particularly avoidance of relevant allergens and respiratory irritants, is essential to achieve adequate control. Patients may be supported with:

- A written action plan
- Practical information regarding avoidance of allergens and respiratory irritants
- Identification of an asthma support team
- Education regarding proper use of medications and technique of administration
- Education regarding what constitutes 'control'
- Self-monitoring using either measurement of PEF or symptom monitoring
- Diaries
- A patient registry
- Referral to an asthma education program if available

See *Asthma Guide for Patients* and web resources for environmental control material, examples of action plans and other patient education tools.

RECOMMENDATION 3 Control of asthma

Control of airway hyperresponsiveness is the key to success. Most people with asthma should have minimal to no impact on their quality of life.

Review diary, action plan and inhaler technique.

Criteria indicating adequate control:

- Daytime symptoms less than four days/week
- Night-time symptoms less than one night/week
- Normal physical activity
- Mild infrequent exacerbations
- No absenteeism due to asthma
- Fewer than four doses of beta-agonist needed per week apart from 1 dose/day before exercise
- FEV₁ or PEF 90% of personal best or greater
- Diurnal variability in PEF less than 10% to 15%
- No need for emergent/urgent physician visits for asthma

RECOMMENDATION 4 Initiating pharmacological treatment

- If symptoms are infrequent and expiratory flows are normal, an inhaled short acting beta 2 agonist should be used as needed.
- If a rescue beta 2 agonist is needed more than 3 times per week or if lung function is abnormal, an initial inhaled glucocorticosteroid equivalent to 400-1000 mcg/day (child: 200-1000 mcg) of beclomethasone dipropionate is the preferred next step.
- If symptoms are severe and/or expiratory flows are <60% predicted value, oral steroids may be part of the initial management plan.
- In selected cases, the use of long-acting inhaled beta-agonists is helpful, as is the use of combined inhaled long-acting beta agonists and corticosteroids.

High dose (maximum) daily long term inhaled steroid doses		
	Adult	Child
Fluticasone propionate MDI and spacer or diskus	500 mcg	200 mcg
Budesonide turbuhaler	800 mcg	400 mcg
Beclomethasone MDI and spacer - CFC	1000 mcg	400 mcg
Beclomethasone MDI and spacer - HFA	500 mcg	200 mcg

* MDI -Metered dose inhaler, CFC-chlorofluorocarbon (propellant), HFA-hydrofluoroalkane (propellant)

* Chronic, high dose inhaled steroid use may be associated with a number of long term side effects and should prompt consideration of introducing other, steroid sparing medications (e.g., long acting beta 2 agonists or, less often, leukotriene receptor antagonists (LTRA) or other medications).

RECOMMENDATION 5 **Managing chronic asthma**

- Educate patients to actively manage their illness
- Identify and eliminate barriers to effective control
- In your office create:
 - a registry of patients with asthma
 - an automated recall system
 - flowcharts and checklists
- Review care/education offered to patient/family periodically
- Review of asthma symptoms, medication needs, delivery device technique and action plan
- Annual flu vaccine

See the attached sample Personal Action Plan and Guide for patients

Rationale

Asthma is one of the most frequent medical diagnoses among hospitalized children and elderly patients in BC. Despite an increasing understanding of its pathogenesis, asthma remains a major cause of emergency care requirements, missed school, considerable morbidity, disability, and occasional mortality at all ages. The most important contributing factors for inadequate management may include:^{3,-5}

- Delayed diagnosis and insufficient patient education (including airflow measurements)
- Underassessment of the severity of the disease
- Undertreatment with anti-inflammatory agents
- Over-reliance on inhaled beta-agonists
- Failure to consider co-morbid medical conditions e.g rhinosinusitis, gastro-esophageal reflux disease (GERD), cystic fibrosis (CF), depression, or social conditions e.g. family discord, life stresses as contributors

Medical care delivery can be improved by addressing these factors.

During the 1980s, increased death and hospital admission rates were reported in many countries including Canada. These rates have subsequently declined during the 1990s.^{3,6} The true burden of asthma in Canada is hard to quantify because the rates of death (400 to 500 per year) and hospital admissions (78,400 per year) underestimate the disability and lost quality of life experienced by the 8% of Canadians who have this disease.⁶

In British Columbia, there were 58 deaths from asthma in 2001.⁷ From 1994 to 1998 there has been a decrease in the number of cases of asthma patients admitted to hospital and admission days from 6,773 to 4,877 and 26,490 to 17,746 respectively. A review of MSP billings indicates about 350,000 visits coded with a diagnosis of asthma are assigned to about 125,000 patients each year.

Early detection, appropriate treatment, and consistent application of guidelines for education, self-management and follow-up would lead to reduced morbidity and mortality and, possibly, reduction of costs associated with the treatment of asthma.

References

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Sponsors

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This guideline is based on scientific evidence current at the time of the review date.

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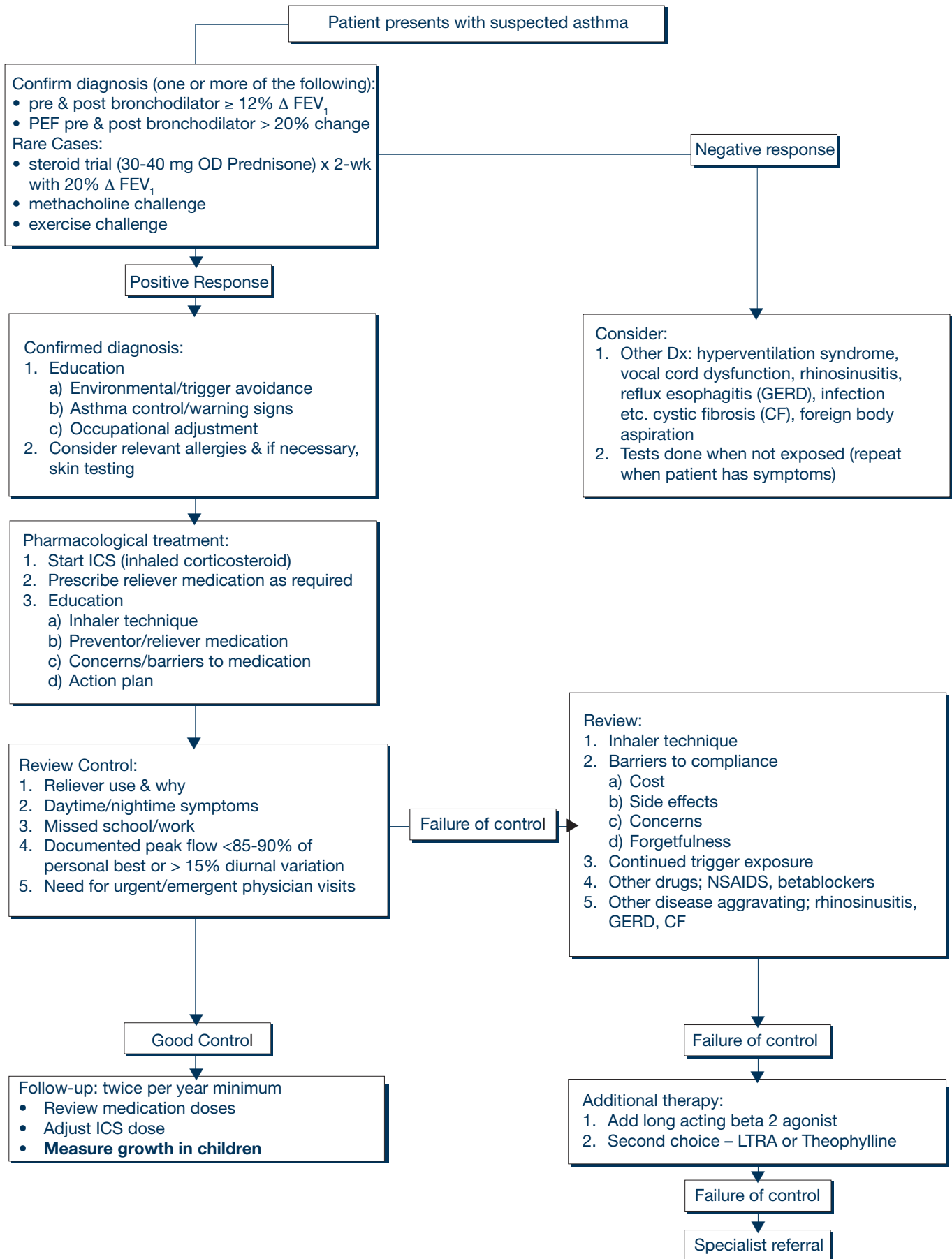
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- to encourage appropriate responses to common medical situations
- to recommend actions that are sufficient and efficient, neither excessive nor deficient
- to permit exceptions when justified by clinical circumstances.

Asthma Diagnosis and Treatment



PERSONAL ACTION PLAN FOR:

DATE:

MY ASTHMA TRIGGERS ARE:

Green Level: GOOD CONTROL

- Normal breathing
- No cough or wheeze
- Normal activity
- Normal sleep

- ✓ Use regular medicine
- ✓ Avoid triggers

Peak Flow Reading:
 _____ to _____
 (80% – 100% personal best)

MEDICINE TAKEN	AMOUNT TAKEN	TIME
		am pm
		am pm
		am pm
		am pm
		am pm
		am pm
		am pm

Yellow Level: CAUTION

- Symptoms with activity or at night
- Symptoms settle well with use of reliever
- Reliever used up to 4 times a day*
- Cold symptoms

Problem beginning

- ✓ Increase medicine at earliest sign
- ✓ Continue medicine until better

Peak Flow Reading:
 _____ to _____
 (60% – 80% personal best)

MEDICINE TAKEN	AMOUNT TAKEN	TIME
		am pm
		am pm
		am pm
		am pm
		am pm
		am pm
		am pm

If asthma symptoms are not improving in a few days, see your doctor.
 *If reliever is needed every 4 hours, see your doctor or go to emergency.

Red Level: DANGER

- Breathing is difficult
- Repeated wheezing at rest
- Difficulty walking and/or talking
- Lips and/or fingernails are blue or gray
- Skin sucked in at neck, between ribs or around collarbone with each breath
- Reliever does not help in 10 minutes (or is needed in less than 3 hours)

Peak Flow Reading:
 _____ to _____
 (<60% personal best)

**Go immediately to hospital emergency!
 Use reliever medication as required while on the way.**

Asthma

A GUIDE FOR PATIENTS

Asthma is a chronic lung condition that can develop at any age. People with asthma have extra sensitive airways. The airways react by narrowing or obstructing when they become irritated. This makes it difficult for the air to move in and out. This narrowing or obstruction can cause one or a combination of the following symptoms:

- wheezing
- coughing
- shortness of breath
- chest tightness

If you've just been diagnosed with asthma, you may feel dismayed. However, with proper management and medication, you, like many other people with asthma, can live a perfectly normal and active life.

Controlling Your Asthma

Your doctor and/or asthma educator can help you control your asthma symptoms. But there's also a lot you can do on your own. By following your doctor and/or asthma educator's advice, and by avoiding your personal triggers, you can take control of your asthma and its symptoms. Much of asthma management is a matter of simple lifestyle modification.

1. Know and Avoid your Personal Asthma Triggers

Asthma attacks are often brought on by triggers. A trigger is any thing or condition that causes you to have an asthma episode. Your personal triggers can be very different from those of another person with asthma. In any case, it's important to avoid personal triggers in order to keep airway inflammation to a minimum and reduce the symptoms. Some common triggers include:

- Dust mites
- Animals
- Cockroaches
- Molds
- Pollens
- Viral infections
- Exercise
- Cold air
- Certain food additives like sulfites
- Intense emotions
- Certain air pollutants (smoke, chemical fumes, perfumes & other strong smelling substances)

If you have an animal in your home and your family doctor or allergist determines that it is a trigger for your symptoms, it is highly recommended that you remove the animal from your home. Removing the pet from the home is the single most effective way to control asthma. If you can't remove an animal from your home, you will be increasing your risk for more severe asthma. To minimize the effects on your asthma:

- Have someone else wash your pet twice a week
- Remove carpeting in the home, especially in the bedroom.
- Clean the house frequently, especially your bedroom, with a vacuum equipped with a high-efficiency particulate air filter (HEPA), or a central vacuum system with an outdoor exhaust.
- Encase your mattress and pillows in special allergen-proof covers.
- Keep your animal out of your bedroom, off upholstered furniture, and away from carpets and other soft surfaces where allergens can accumulate.
- Use a HEPA air cleaner in your bedroom.

2. Use Your Asthma Medications Properly

Medications can be very effective at keeping your asthma under control. Most people with asthma take two kinds of medication:

Corticosteroids, often called “controllers” or “preventers”, are used to reduce inflammation in the airways. Controllers should be taken every day, whether or not you’re experiencing symptoms.

Bronchodilators, often called “relievers” or “rescuers”, are used to alleviate temporary breathing problems due to the constriction in the bronchial tubes provoked by triggers. They are very good at helping to alleviate symptoms immediately, but do nothing for the underlying problem and are only a short-term solution. Tell your doctor if you are using your reliever medicine (e.g. your “puffer”) more than 4 times a week, as excessive use of relievers indicates that you may need to have your medication adjusted.

3. Take Charge of your Asthma

The best way to manage your asthma is to be actively involved in your own treatment:

- Take your medications as directed by your doctor. Incorrect use of asthma medication can result in poor asthma control.
- Develop an asthma “action plan” with your doctor to help you understand what to do everyday, if your asthma gets worse, and for emergencies.
- Stay away from the environmental triggers that can cause you to have asthma attacks.
- Keep an asthma “diary” to monitor and record your level of asthma control and share it with your doctor and/or asthma educator.
- Bring your inhaler to your doctor or your pharmacist to check how well you are using the device.

Web Resources for People with Asthma

The following web sites provide some reliable information about asthma.

The B.C. Chronic Disease Management Web site provides patient information and resources on asthma and other common chronic illnesses. (<http://www.healthservices.gov.bc.ca/cdm/patients/index.html>)

The BC HealthGuide OnLine has a world of health information just a click away, through the award-winning Healthwise Knowledgebase®. Detailed information about asthma and other chronic diseases is available here. (<http://www.bchealthguide.org/kbaltindex.asp>). Or you can call the BC NurseLine for advice and information any time day or night at 604 215-4700 (Greater Vancouver) or 1-866-215-4700 (toll free) if outside the lower Mainland.

The Asthma Society of Canada, established in 1974, is a national registered charity that focuses solely and comprehensively on asthma education and research, and has a long history of providing unbiased, credible information on asthma. (<http://www.asthma.ca/adults/>) or phone 1-800-787-3880 (toll free).

The Asthma In Canada Web site contains excellent information on asthma, including a Patient Self-Assessment Form. (<http://www.asthmaincanada.com/>)

The British Columbia Lung Association has an excellent site that includes information on asthma programs and education resources available in B.C. (<http://www.bc.lung.ca/>) or contact them at by phone at: 604 731-5864, or 1-800-665-5864 (toll free) if outside the Lower Mainland.