

BRONCHIAL ASTHMA

Clinical Practice
Guideline for General
Practitioners

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Bronchial Asthma: Clinical Practice Guideline for General Practitioners



This manual is made possible through support provided by the US Agency for International Development (USAID). The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of USAID.

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Acknowledgments

The guideline on management of bronchial asthma was developed by the members of the Azerbaijan Clinical Practice Guidelines expert group. We would like to thank the members for their significant contributions to the process and, indeed, to the final product.

- Prof. Kamal Hajiyev, MD PhD., program coordinator, Baku Children’s Rehabilitation Center
- Prof. A.A. Eyubova , MD, PhD, chair of the Society of Immunologists of Azerbaijan
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The guideline is intended for health care professionals, including family physicians, nurses and social workers providing primary health care to patients with bronchial asthma. It includes practical and evidence-based information about diagnosis, out-patient management and prevention of the disease in adults and adolescents.

We are also indebted to those individuals on the AIHA CPG Steering Committee who graciously shared their knowledge and expertise. Their comments and advice were key to ensuring the clarity and accuracy of this document. In particular, we would like to thank

- Dr. Steven Kairys, chairman of pediatrics, Jersey Shore Medical Center, New Brunswick, New Jersey; co-chairman of AIHA's Clinical Practice Guidelines Region-Wide Advisory Committee
- Dr. Alan Melnick, director of the Joint Residency Program, Department of Family Medicine, Oregon University for Health Science, Portland, Oregon

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- Dr. Kermit Newcomer, co-chairman of AIHA's Clinical Practice Guidelines Region-Wide Advisory Committee, La Crosse, Wisconsin

Our very special gratitude goes to Jo Ann Kairys, Director of the Center for Healthy Families and Cultural Diversity at the Robert Wood Johnson Medical School and member of the American Association of Medical Writers, whose diligent work during the editing of the manual was instrumental to the completion of this project.

The American International Health Alliance (AIHA) also would like to acknowledge Inna Jurkevich, MD, and Ruzan Avetisyan, MD, who have provided leadership to the Clinical Practice Guideline Cross-partnership Program and who reviewed drafts of the document.

Financial and technical support for the development of this manual was provided by the United States Agency for International Development (USAID).

Bronchial Asthma: Clinical Practice Guidelines For General Practitioners

Purpose of the Research: To improve and unify bronchial asthma diagnosis, treatment and prophylaxis techniques in primary healthcare.

Sources: The guideline is based on the latest recommendations of the World Health Organization, the National Institute of Heart, Lungs and Blood (USA), several Russian National Programs, Oregon Population-Based Guidelines on Asthma, and the Azerbaijan Society of Allergists and Immunologists, etc.

Information Collection and Analysis:

Information was collected from medical libraries, periodicals, specialized web sites, scientific forums and the AIHA database. Experts of the Azerbaijan partnership analyzed the materials and wrote the guidelines with assistance from the Caucasian regional AIHA coordinators.

Clinical Focus of the Guideline: The guideline consists of an introduction, description of diagnostic, treatment and prophylaxis methods, and an overview of educational programs recommended for medical doctors, nurses, patients and their families.

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Target Patient Groups: Bronchial asthma adult and adolescent patients attending general outpatient clinics, family medicine clinics, and allergology and pulmonology outpatient centers.

Expected Users: The guideline was designed for physicians, nurses, and social workers providing primary health care to patients with bronchial asthma.

Expected Results: Introduction of the guideline in practical health care settings will help to promote enhanced and unified bronchial asthma diagnosis, treatment, and prophylaxis methods.

1. Introduction

1.1 BACKGROUND

Bronchial Asthma (BA) is one of the most frequent chronic and recurrent diseases. In the last few years the incidence of the disease has been on the rise virtually everywhere. It is estimated that an average of 8% of the world population suffer from bronchial asthma. In Baku, the prevalence of the disease increased about three times in the last 10-15 years and currently stands at 48.5 per thousand. In most cases the form of the illness is moderate to severe (14.5% and 75.5%, respectively). It has been shown to have more severe forms in people of low social status, such as the unemployed, refugees, forced migrants, etc.

According to the modern view, BA of any severity is a chronic inflammatory disease accompanied by hyper-responsiveness and hypersensitivity of the bronchi. Clinical manifestations of the disease include periodical expiratory or mixed dispnea (asphyxia) due to obstruction of the airways caused by constriction of the bronchi, excessive mucus secretion, and pulmonary edema.

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One of the most important factors preventing effective management of the disease is a lack of commonality in understanding the pathologic mechanisms of bronchial asthma, and the absence of common classification or unified treatment and prevention methods in many regions including Azerbaijan. However, based on the data from evidence-based medicine, leading BA experts have generally reached a consensus on key clinical aspects of BA. On the basis of this consensus the World Health Organization and other international medical organizations have developed the so-called Global BA Treatment and Prevention Initiative. The use of the modern recommendations of the Global Initiative in practical health

CLASSIFICATION OF SEVERITY CLINICAL SIGNS PRIOR TO BA MANAGEMENT			
Step	Symptoms	Nighttime Symptoms	Lung Function
Step 4 Severe Persistent	Continual symptoms. Limited physical activity.	Frequent	PEF \leq 60% predicted PEF variability $>$ 30%
Step 3 Moderate Persistent	Daily symptoms. Daily use of inhaled short-acting beta2-agonists. Exacerbations affect activity.	$>$ 1 time a week	PEF $>$ 60%- $<$ 80% predicted PEF variability $>$ 30%
Step 2 Mild Persistent	Symptoms $>$ 1 times a week but $<$ 1 time a day	$>$ 2 times a month	PEF \geq 80% predicted PEF variability 20-30%
Step 1 Mild Intermittent	Symptoms $<$ 1 times a week or asymptomatic between exacerbations	\leq 2 times a month	PEF \geq 80% predicted, PEF variability $<$ 20%

care settings will allow raising the quality of disease management and prevention.

The modern BA classification of severity is based on the step-by-step approach for both adults and children. One of the signs listed in the table on the previous page is sufficient to identify the step.

2. System of Care for Patients with Bronchial Asthma

2.1. FLOWCHART FOR THE PROCESS OF HEALTH CARE FOR PATIENTS WITH BRONCHIAL ASTHMA

(See flow chart on following page.)

2.2. DESCRIPTION OF PROCESS OF CARE

Management of Asthma and Quality Measures

2.2.a. Screening.

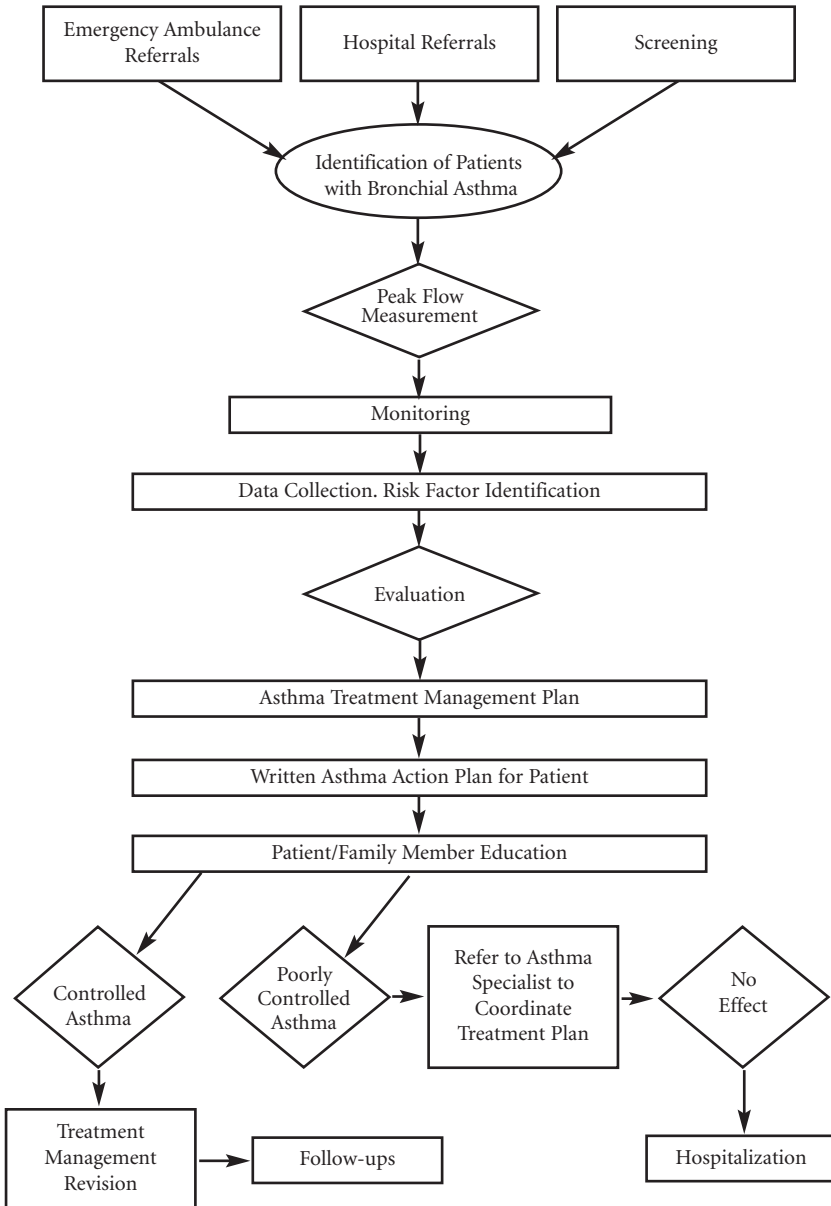
Either the GP or Nurse can conduct screening. The international expert group CINA has recommended the following table for BA screening.

(See table on page 10.)

2.2.b. Peak Flow Measurement.

Peak flow monitoring is essential for all patients with asthma revealed through the survey.

- Peak expiratory flow (PEF) increases more than 15% in 15–20 minutes after inhalation of rapid action beta2-agonists; or



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- PEF variability is greater than 20% over a 12 hour-period compared with morning values in patients taking bronhchodilators (or greater than 10% in patients not taking bronchodilators); or
- PEF drops more than 15% after 6 minutes of running or physical exercises.

2.2.c. Peak Flow Monitoring Quality Measures

- **Documentation**

Provision of peak flow measurement is documented in the patient's medical chart.

- **Population-Based Measures**

A successful program will show an increase in the percentage of people with asthma who have a peak flow measurement in their chart.

2.2.d. Risk Factor Identification and Control

Successful asthma treatment largely depends on the identification and control of asthma triggers, *i.e.*, factors that cause asthma exacerbations. Eliminating triggers from the patient's environment helps prevent the occurrence of the disease symptoms and decrease the need for medications. The most common allergens and irritants causing asthma exacerbations are bed mites, hair and other animal allergens, cockroaches, pollen, mould, and smoke from domestic ovens. Other BA triggers also include viral infections, physical

stress, food allergies, aspirin and other non-steroid anti-inflammation medications, beta-blockers, etc.

1. **Bed mites are the most important element of domestic dust.** Mites are microscopic in size.

TABLE FOR BA SCREENING - IS IT ASTHMA?

BA should be suspected if any of the following symptoms are observed:

- Dry rales— high-toned whistling sounds on exhalation, particularly in children (normal results might not exclude asthma diagnosis).
 - The following symptoms in patient’s anamnesis:
 - Coughing, particularly if aggravated at night
 - Recurrent dry rales
 - Recurrent difficulty in breathing
 - Recurrent asphyxia
- Note: eczema, pollen disease, asthma or atopic diseases in family history may often be related to asthma.*
- Manifestation or aggravation of the symptoms at night, forcing the patient to wake up.
 - Manifestation or aggravation of the symptoms:
 - During physical exercises
 - During viral infections
 - After exposure to allergens (animal hairs, domestic dust mites, tobacco smoke, and pollen)
 - Changes of temperature
 - Strong emotions (loud laugh or cry)
 - Exposure to chemical sprays
 - Certain medications (aspirin, beta-blockers)
 - Reversible and temporary air flow obstruction, as measured by peak flow meter in any of the following settings:
 - Peak expiratory flow (PEF) increases more than 15% in 15–20 minutes after inhalation of rapid action beta2-agonists; or
 - PEF variability is greater than 20% over a 12 hour-period compared with morning values in patients taking bronchodilators (or greater than 10% in patients not taking bronchodilators); or
 - PEF drops more than 15% after 6 minutes of running or physical exercises.

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They do not cause or transfer any diseases.

They eat exudations of human skin and can be found in large numbers in mattresses, blankets, carpets, furniture upholstery, curtains and other items susceptible to dust. They multiply particularly fast in a moist and stuffy environment. Children who are exposed to domestic dust allergens at an early age can develop BA later in their lives.

Prophylaxis: Bed linen and blankets should be washed once every 7 to 10 days at a temperature above 60°C. Also, mattresses, blankets and pillows should be periodically dried in sunlight. Bed linen should be made of dense starched material. Special anti-allergic covers are especially useful. Wall and floor carpets, soft toys, stuffed animals, and draped furniture should be removed (at least, from the sleeping quarters). The rooms should be regularly cleaned using dry and wet cloths, and aired.

2. **Animal allergens (cats, dogs, rabbits, and hamsters) often enhance the risk.**

Prophylaxis: Pets should be removed from the house or at least from the sleeping quarters and the house should be regularly wet cleaned. The use of the air cleaner in the house is recommended.

3. Tobacco smoke can enhance risks if the patient smokes or lives in a smoking environment.

Tobacco smoke increases the risk of sensitization in children and can make symptoms more severe.

Prophylaxis: Quit smoking and encourage others to quit or at least avoid smoking in the patient's presence. Do not visit public areas that are not smoke free.

4. Cockroach allergen can often trigger BA.

Prophylaxis: The house should be regularly and thoroughly cleaned and the pesticides applied when the patient is not home. The house should be aired prior to the patient's arrival, and the use of the air cleaner is recommended.

5. Mold, other fungal spores, and pollen can cause exacerbations in most patients and sometimes can even be the sole trigger.

Prophylaxis: During periods when a high content of pollen and spores are in the air, patients should stay inside and keep the windows closed. The use of the air cleaner in the house is recommended.

6. Smoke from burning wood and other domestic air pollutants can often trigger exacerbations.

Prophylaxis: Chimneys should be properly installed, rooms thoroughly aired, and polish-

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ing sprays avoided. The use of the air cleaner is recommended.

7. Colds and viral respiratory infections often cause bronchial asthma exacerbations, particularly in children.

Prophylaxis: Common steps to prevent acute viral respiratory infections: body conditioning, and annual vaccination against grippe in patients with moderate to severe asthma. After emergence of the initial symptoms of cold, patients should be given inhalations of short action beta2-agonist, and peroral glucocorticosteroid therapy should be initiated. Anti-inflammatory treatment should continue for several weeks until complete elimination of the disease symptoms. Bronchial asthma symptoms can continue to manifest themselves for several weeks after the patient suffered from an infection.

8. Physical activities can trigger exacerbations in most BA patients.

Prophylaxis: With correct management, most bronchial asthma patients can endure a lot of physical stress, including running and sports activities. Inhalations of short and long action beta2-agonists or sodium chromoglicate before physical stress are a very efficient method of preventing asthma symptoms. Unlike other triggers, physical activities should not be avoided.

9. **Penicillin derivatives and Beta-Adrenoblockers can cause BA exacerbations.** Therefore, these medications should not be prescribed to BA patients.

10. **Food allergens and acetylsalicylic acid derivatives may often be the cause of BA or trigger BA exacerbations.** In order to identify these risk factors, it is recommended to keep a nutrition diary and to eliminate problematic foods and medications.

In order to decrease exposure to triggers, many patients need a change in their lifestyles, which may be difficult to accomplish both for the patient and their families. It is therefore necessary for the medical care provider to work together with the patient to identify the best method to lower their BA trigger exposure. Getting rid of the pets may be too disheartening for the entire family, but at least the pets can be moved out of the house or disallowed access to the sleeping quarters. Exposure of newborns to domestic mites may trigger development of BA, but since the birth of the baby will require the family to change their lifestyle anyway, it may be a good time to take the necessary preventive measures, at least for a period until the baby is six months to one year old. It may be difficult to part with pets, use the air cleaner and anti-allergic mattress cases, or to frequently wash bed linen in hot water; however, these measures are essential in effective BA management.

2.2.e. Risk Factor Identification and Control—Evaluation and Quality Measures

Documentation

Documentation in the medical chart of assessment, provision of information, and treatment (if applicable).

Patient* survey results asking if:

1. Patients* with persistent asthma are able to identify their asthma triggers.
2. Patients* with persistent asthma have an understanding of how to reduce their exposure to relevant allergens and irritants.
3. Patients* with persistent asthma smoke, or are routinely exposed to environmental tobacco smoke.

** If patient is a child, this refers to the parent of patient.*

Indicators

Short-term:

A successful program will show an increase in the number of patients with persistent asthma with documentation they have been asked at least once about:

- Dust-mites
- Animal allergens
- Environmental tobacco smoke
- Exercise-induced bronchospasm

A successful program will show an increase in the number of people with persistent asthma who have received education about their triggers and how to reduce their exposure to them.

Long-term:

- A successful program will show a decrease in the number of people with persistent asthma who report that they smoke.
- A successful program will show a decrease in the number of people with persistent asthma who are routinely exposed to environmental tobacco smoke.

**2.2.f. Description of Process of Care:
Step-by-Step Long-Term Asthma
Management**

This Step approach is recommended for asthma management since the asthma severity of the same patient varies in different periods of time.

Step	Daily Medications (Preferred treatments are in bold)	Quick Relief
<p>Step 4 Severe Persistent</p>	<ul style="list-style-type: none"> • Inhaled corticosteroid (800-2000 microgram and more) AND • Long-acting bronchodilator: either long-acting inhaled beta 2-agonist, sustained-release theophylline, and/or long-acting beta2-agonists tablets or syrup AND • Corticosteroid tablets or syrup long term 	<ul style="list-style-type: none"> • Short-acting bronchodilator: short-acting inhaled beta2-agonists as needed for symptoms.
<p>Step 3 Moderate Persistent</p>	<ul style="list-style-type: none"> • Inhaled corticosteroid (800-2000 microgram) AND • Long-acting bronchodilator: long-acting inhaled beta2-agonist, sustained-release theophylline, or long-acting beta2-agonist tablets or syrup—especially for nighttime symptoms 	<ul style="list-style-type: none"> • Short-acting bronchodilator: inhaled beta2-agonists as needed for symptoms—no more than 3-4 times a day
<p>Step 2 Mild Persistent</p>	<ul style="list-style-type: none"> • Inhaled corticosteroid (200-500 microgram) or cromoglycat, nedocromil or sustained-release theophylline • If necessary increase inhaled corticosteroids up to 500-800 mcg per day, as well as add long-acting beta2-agonist tablets or syrup, or sustained-release theophylline—especially for nighttime symptoms 	<ul style="list-style-type: none"> • Short-acting bronchodilator: inhaled beta2-agonists as needed for symptoms—no more than 3-4 times a day
<p>Step 1 Mild Intermittent</p>	<ul style="list-style-type: none"> • No daily medication needed. 	<ul style="list-style-type: none"> • Short-acting bronchodilator: inhaled beta2-agonists as needed for symptoms ≤once a week. Intensity of treatment depends upon severity. Inhaled beta2-agonist or cromoglycat before physical exercises or contact with allergen.

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The goal is to manage the asthma therapy by using the minimum number of medications. The number of medications and the frequency of their use will increase (Step Up) if the patient's status deteriorates and will decrease (Step Down) if asthma is well controlled.

Step Down

Review treatment every 3 to 6 months. If control is sustained for at least 3 months, a gradual step-wise reduction in treatment may be possible.

Step Up

If control is not achieved, consider Step Up. But first: review patient medication technique, adherence, and environmental control (avoidance of allergens or other precipitant factors).

An individual Asthma Therapy Management Plan should be developed for each patient with asthma. All BA patients and their family members should be trained on asthma self-management and what to do in case of an exacerbation. They should learn how to identify the risk factors and how to avoid them. The following is the general plan of PHC actions on identifying and managing patients with asthma.

2.3. PROTOCOLS OF CARE/MEDICAL CASES: WRITTEN ASTHMA ACTION PLAN AND CLINICAL RECOMMENDATIONS

Category of Patient	Recommended Procedure	Schedule
Mild Intermittent	All patients with mild intermittent asthma should have a dated, written asthma action plan, including information on what to do in case of an exacerbation.	At least once. Should be reviewed and updated as needed with current provider.
All Patients with Persistent Asthma	All patients with persistent asthma should have a dated, written asthma action plan, including daily medication management activities and what to do in case of an exacerbation.	At least once. Should be reviewed and updated at least annually with current provider.

2.3.a Referral to Asthma Specialist

Refer patient to an asthma specialist for an asthma treatment management plan if the patient has a confirmed diagnosis of asthma, is currently under appropriate management, and has experienced one or more of the following:

- Hospitalization with a diagnosis of asthma
- Two emergency department visits with a diagnosis of asthma within one year
- Three or more visits to the primary care provider (PCP) for emergency treatment requiring acute office treatment with bronchodilator within one year
- Condition causes substantial interference with

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quality of life (school/work loss, inability to participate in sports, nocturnal asthma, significant side effects from medications, etc.) and is unresolved with the current approach

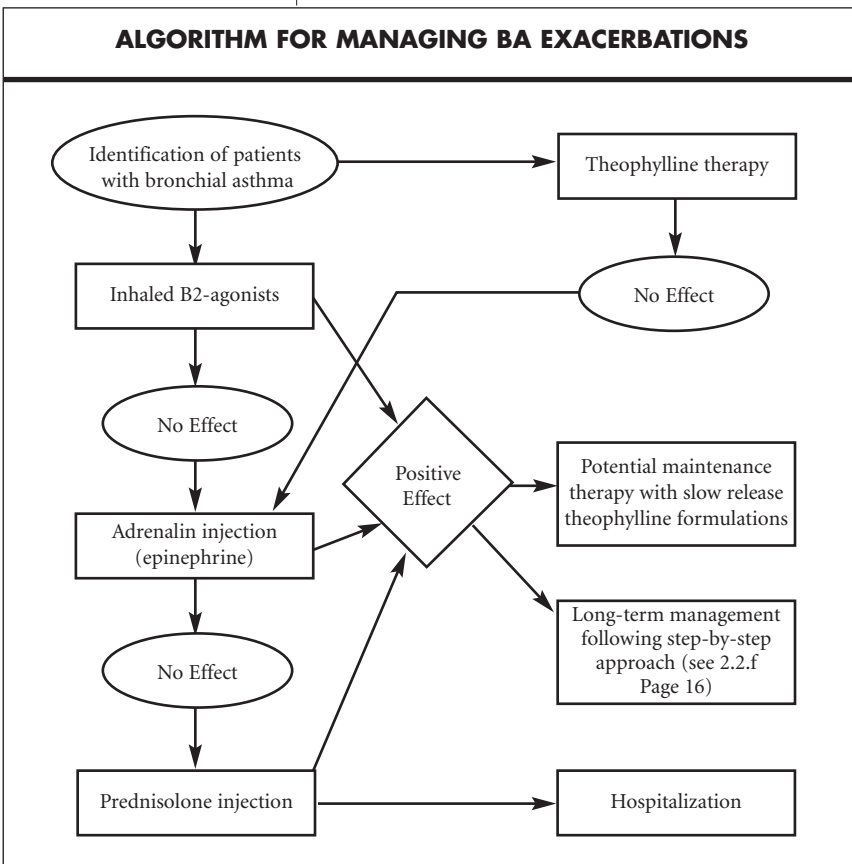
- Three or more asthma medications on a daily basis without control of symptoms
- Chronic cough lasting more than two months that is refractory to standard therapy
- Use of daily oral steroids for more than two weeks or frequent bursts of oral steroids
- Excess lability in pulmonary function with the use of anti-inflammatory medication

2.3.b. Protocols of Care: Quality Measures

Documentation	Indicators
<ul style="list-style-type: none">• Documentation in a medical chart of referral to a medical practitioner, or asthma specialist, if indicated.• Claims data that reflect a referral to a medical practitioner or asthma specialist, if indicated.	<ul style="list-style-type: none">• A successful program will show an increase in the number of people who have been seen by an asthma specialist within one month of discharge date, following an inpatient admission for asthma.• A successful program will show an increase in the number of people who have been seen by a medical practitioner within one month of an emergency department visit.• A successful program will show an increase in the number of people who have been seen by an asthma specialist within one month of the most recent emergency department visit. For those people having had two emergency department visits for asthma treatment: within one calendar year.

2.3.c. Protocol for Bronchial Asthma Exacerbations

Even with mild intermittent asthma, exacerbations might occur. The initial step in this case should be inhaled beta2-agonists. In case of beta2-agonists' lack or absence, theophylline medications should be an alternative therapy. The following is the plan of managing asthma exacerbations.



2.4. PATIENT/FAMILY EDUCATION CARE MANAGEMENT

Building a partnership with the patient, family, and clinician is an integral piece of successful self-management of asthma. The partnership provides an opportunity for patients to actively participate in their asthma care through the development of long- and short-term goals with the clinician. It is important to tailor asthma education to each individual, taking into account cultural or ethnic beliefs or practices that may influence asthma self-management.

2.4.a. Quality Measures for Patient/Family Education Care Management

Documentation	Indicators
<p>On survey, patients:</p> <ul style="list-style-type: none">• Affirm receipt of information and demonstration of technique;• Report high levels of confidence in understanding and ability to perform;• Report behavior consistent with high levels of education; <p>OR</p> <ul style="list-style-type: none">• Provision of education is documented in the chart.<ol style="list-style-type: none">1. Basic facts2. Medication3. Skills4. Environmental control measures5. Rescue action.	<p>A successful program will show an increase in the percentage of the population with asthma surveyed who:</p> <ul style="list-style-type: none">• Affirm receipt of information and demonstration of technique;• Report high levels of confidence in understanding and ability to perform;• Report behavior consistent with high levels of education; <p>OR</p> <ul style="list-style-type: none">• A successful program will show an increase in the percentage of patients who have provision of education documented in their chart.

2.5. SYSTEM OF CARE FOR CHILDHOOD BRONCHIAL ASTHMA

Presentation of bronchial asthma in children of senior age group is similar to adult asthma presentation; therefore, diagnostics is based on general principles. Due to specific anatomic and physiological features, infant asthma is usually masked by frequent “common colds,” recurrent pneumonia, and obstructive bronchitis. Though thorough analysis of patient history (family predisposition, atopy, linkage of disease with trigger factors, etc.), clinical signs, results of laboratory tests and instrumental investigations, positive dynamics of disease treated with anti-asthmatic medications help to make timely and proper diagnosis of asthma even in infants. Above-mentioned tests and

CLASSIFICATION OF ASTHMA SEVERITY IN CHILDREN UNDER 5 YEARS		
Step	Attacks	Nocturnal Attacks
Step 4 Severe persistent	Persistent. Reduced exercise tolerance.	Frequent.
Step 3 Moderate severity	Persistent. Daily use of B2-agonists. Attacks reduce exercise tolerance of patients.	More than once a week.
Step 2 Mild Persistent	More than once a week, but less than once a day.	More than twice a month.
Step 1 Intermittent	Less than once a week. PEF readings in periods between the attacks are close to normal.	Less than twice a month.

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investigations include X-ray, increased blood eosinophilia and signs of general IgE, and positive results of skin tests with most common allergens.

The main classification criterion of childhood and adult asthma is severity of disease symptoms. Classification is based on stepwise approach:

Exacerbation of disease: attacks of asthma might vary in severity. The following criteria are used for evaluation of attack severity:

- Respiration rate
- Use of accessory muscles of respiration
- Intensity of wheeze
- Chest deformity—hyperinflation
- Auscultation data: character of respiration and its conduction
- Pulse rate
- Forced posture
- Behavioral changes
- Level of reduction of exercise tolerance
- Volume of treatment used for relief of acute attacks (medications and ways of their administration)

Severe attacks may cause following complications: cor pulmonale, emphysema, spontaneous pneumothorax, and various neurological and endocrine deterioration. Following criteria are suggested to assess the level of severity:

2.5.a. Severity of Childhood Asthma Attacks

ASSESSMENT CRITERIA				
Signs	Mild	Moderate severity	Severe	Threat of breathlessness (status asthmaticus)
Physical Activity	Maintained	Reduced	Forced posture	Inability
Speech	Maintained	Restricted Can talk with separate phrases	Difficulties	Inability
Consciousness	Occasional agitation	Agitation	Agitation, fright	Impaired consciousness, coma
Respiration Rate	Increased frequency	Marked expiratory breathlessness	Expiratory breathlessness—very strong	Tachipnoea or bradipnoea
Involvement of Accessory Muscles	Slight	Marked	Very strong	Paradoxical thoraco-abdominal
Wheezing	Usually at the end of expiration	Marked	Very strong	“Silent lungs”, no respiratory sounds
Pulse rate	Increased	Increased	Increased greatly	Bradycardia
FEV₁, PEF—% variations from normal	More than 80%	60–80%	Less than 80% of normal	

2.5.b. Description of Process of Care

In cases of acute attacks in children, urgent care is provided using short-acting B₂-agonists, anticholinergic drugs or short-acting theophyllines. B₂-agonists are used in these cases: Salbutamol, Terbutaline and Phenoterol. Use of inhaled B₂-agonists is preferable. 1–2 inhalations are given as usual. Inhalations should be repeated 2–3 times every 20–25 minutes, if needed. Effect is gained in comparatively short time: 5–10 minutes. If inhaled treatment or nebulizers are not available, consider use of above-mentioned drugs in form of tablets or syrup, or short-acting theophyllines. Theophylline is prescribed in doses that maintains its serum concentration at the levels of 8–15 microgram/ml. This concentration could be achieved by prescribing theophylline in daily dose of 10–15 mg per 1kg of body mass of child.

In certain cases (acute attacks, provoked by acute viral respiratory infection or high concentrations of inhaled pollutants) in the senior child age group (adolescents) and in infants, good control is achieved by inhalation of anticholinergic drugs (Ipratropium bromide, Oxitropium bromide) and/or their combination with short-acting B₂-agonists. If a sudden very severe attack develops and inhalation use is impossible, bronchial obstruction could be quickly relieved by subcutaneous injection of adrenaline (epinephrine)—0.1–0.5 per injection. In cases of non-compliance and if the child’s condition worsens, systemic steroids (glucocorticosteroids) are administered

(*e.g.*, i/m injection of Prednisolone—1–2 mg per 1kg of child body mass). In cases of non-compliance, when all of the above-mentioned complex of measures are taken and the threat of asphyxia still exists, urgent admission to specialized hospital department is necessary.

3. Provision for the Process of Asthma Therapy Management

3.1 STAFF:

- General Practitioner
- Nurse

3.2 MEDICATIONS:

- Corticosteroids (inhaled, tablets, injections)
- Short-term and long-term beta2-agonists
- Theophyllines
- Na cromoglycat
- Nedocromil

3.3 EQUIPMENT:

- Spacers (chambers)
- Nebulizers
- Peak flow meters

3.4 CONTINUING MEDICAL EDUCATION

Successful BA management programs and the quality of the patient's life greatly depend on the level of professional education of the medical care providers, patient and family on BA nature, treatment and prevention methods, the skills necessary to help the patient during exacerbations, and patient self-monitoring abilities, etc. To this end, it

is recommended to establish training programs for physicians, nurses, patients and family members. Below is a suggested curriculum for such educational programs.

3.4.a. Educational Programs for General Practitioners

Type: Seminars

Instructors: Specially trained physicians, allergists, pulmonologists

Topics:

- Current views of the nature of BA
- BA diagnostics
- Inflammation therapy, which is a major essential element in BA treatment
- Step-by-step approach to long-term BA therapy
- Medical interventions during BA exacerbations

3.4.b. Educational Programs for Nurses

Type: Trainings

Instructors: general practitioners, trained nurses

Topics:

- Current knowledge of BA
- Equipment used in BA treatment (peak flow meters, inhalation devices, anti-allergic pillow cases and sheets, acaricides, etc.)
- Patient monitoring
- How to help a patient during an exacerbation
- Training nurses to educate patients and families

3.4.c. Educational Programs for Patients and their Families

1. Basic Facts about Asthma
 - The contrast between asthmatic and normal airways
 - What happens to the airways during an asthma attack

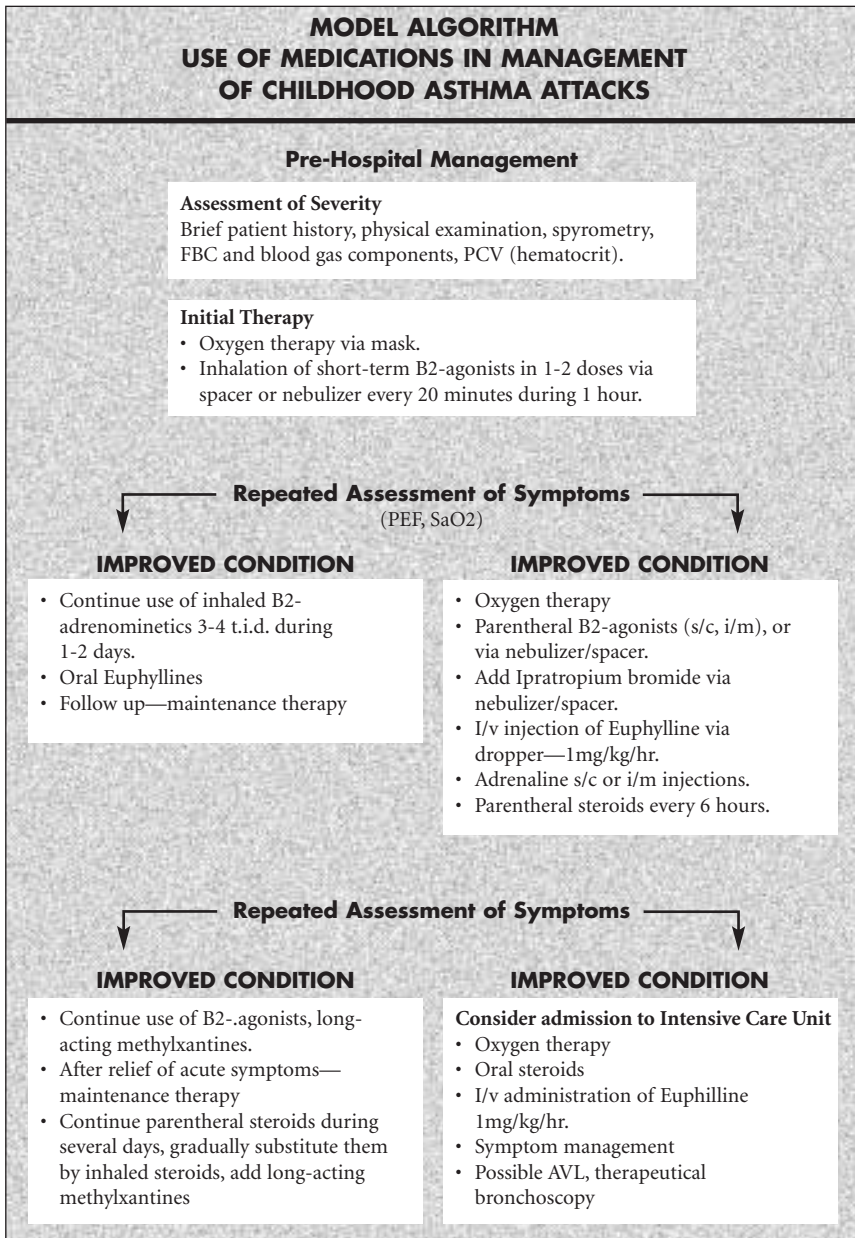
2. Role of Medication:
 - How medications work
 - Long-term control: medications that prevent symptoms, often by reducing inflammation
 - Quick relief: short-acting bronchodilator relaxes muscles around airways
 - Stress the importance of long-term control medications and not to expect quick relief from them.

3. Environmental Control Measures
 - Identifying and avoiding environmental precipitants or exposures
 - Preventing infections

4. When and How To Take Rescue Action
 - Symptom monitoring and recognizing early signs of deterioration
 - Responding to changes in asthma severity (written asthma action plan)

5. Skills

- Inhaler use
- Spacer/holding chamber use
- Peak flow monitoring (if prescribed)





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