



Pocket National Asthma Guideline

Saudi National Asthma
Committee

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Preface

Asthma is one of the most common chronic diseases in children and adults. It is also a common cause of visits to the emergency department as well as admission to the hospital. Among its plan for control of non-communicable diseases (NCDs), the Ministry of Health in the Kingdom of Saudi Arabia has long recognized that good control of asthma symptoms and prevention of acute asthma exacerbations have tremendous effect on the well-being of asthmatic patients and on saving the rising cost of medical care.

This pocket guideline aims to improve the care of asthmatic patients, and serve physicians (non-asthma specialists) as a quick and easily accessible guide. The specialized physician including ED physician, should consult a detailed guideline for further management of asthmatic.

The educational material for asthmatic patients is prepared in Arabic and shall be provided as a supplement to this guidelines. The education material is to help in the assessment of patient's condition, explain the proper use of medications, and guide their treatment at home.

We hope that this booklet is fully utilized in day-to-day patients' care.

The Saudi National Committee on Asthma

Acknowledgment

The National Bronchial Asthma Program of Ministry of Health is pleased to announce the Pocket National Asthma Guidelines, which was never possible without the support and guidance of the Saudi National Committee on Asthma and the coordinators of the National Asthma Control Program from the regions. These guidelines will help the practitioners in their primary duty of patient care to their utmost satisfaction and quality of care.

Ministry of Health is obliged to extend its heartfelt felicitations to the Chairman (Dr. Ziad A. Memish) without whom this task could not be materialized: The dedication of the Saudi National Asthma Committee is a secret of its success and its members

It was their continued guidance and technical direction that enabled the National Asthma Control Program to deliver on this very important requirement. The Committee reviewed the different portions of the guidelines during the process of development and these continuous inputs enabled the timely finalization of the process.

we are indebted to the technical contribution of all regional coordinators and physicians from different regions of the Kingdom, who participated in the consultative workshops and contributed their efforts.

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Abbreviation Index:

SABA: Short acting beta2-agonists

LABA: long acting beta2-agonists

ICS: Inhaled corticosteroids

LTRA: Leukotriens receptor antagonist

FEV1: Forced expiratory volume in the first second

PEFR: Peak expiratory flow rate

Approach to suspected Asthma Patient

What is asthma?

Asthma causes symptoms such as wheezing, shortness of breath, chest tightness and cough that vary over time in their occurrence, frequency and intensity.

These symptoms are associated with variable expiratory airflow, i.e. difficulty breathing air out of the lungs due to bronchoconstriction (airway narrowing), airway wall thickening and increased mucus. Some variation in airflow can also occur in people without asthma, but it is greater in asthma. There are different types of asthma, with different underlying disease processes.

When general practitioners encounter patients already diagnosed as bronchial asthma or with symptoms suggestive of asthma such as cough, wheeze and shortness of breathing he/she should follow the following steps:

First visit Goals:

1. Ascertain Diagnosis of Asthma
2. Assessment of Asthma Control
3. Set up management plan
4. Prescribe appropriate medication.
5. Conduct patient /family education.
6. Give a follow up appointment.

Definition of asthma:

Asthma is a chronic inflammatory disease of the airways that results in reversible narrowing of hyper-responsive airways.

Step1. Ascertain Diagnosis of Asthma:

Comprehensive assessment of each patient should always be completed by treating physician particularly during the first visit. The physicians are encouraged to use the initial assessment form (table 1) which covers the essential aspects required to ascertain diagnosis of asthma, assess degree of asthma control, future risk for poor outcome, identifying trigger factors that shall help in recommending treatment, and suggest alternative diagnosis.

Table 1. Asthma patient assessment form:

A	Symptoms of the episode*	Components		Shortness of breathing	<input type="checkbox"/> Y <input type="checkbox"/> N		
				Chest tightness	<input type="checkbox"/> Y <input type="checkbox"/> N		
				Cough	<input type="checkbox"/> Y <input type="checkbox"/> N		
				Wheezes	<input type="checkbox"/> Y <input type="checkbox"/> N		
		Variability		Exacerbation after Exposure to triggers	<input type="checkbox"/> Y <input type="checkbox"/> N		
				Relieved after SABA use	<input type="checkbox"/> Y <input type="checkbox"/> N		
				More at night or early morning	<input type="checkbox"/> Y <input type="checkbox"/> N		
		Severity		Frequency / Week	____ / Week		
				Causing waking at night	<input type="checkbox"/> Y <input type="checkbox"/> N		
				Recent visit to OPD / ER	____ / Month		
		Hospitalization Frequency	____ / Year				
		Frequency of SABA use	____ / week				
		Interruption of daily activities	<input type="checkbox"/> Y <input type="checkbox"/> N				
B	Future Risk	Frequency of admission to ED or hospitalization		____ / Year			
		Admission to Critical Care		____ / Year			
		Current use of systemic corticosteroids or recent withdrawal from systemic corticosteroids.		<input type="checkbox"/> Y <input type="checkbox"/> N			
C	Other Symptoms	Nasal block / running nose / Sneezing/ Eye allergy		<input type="checkbox"/> Y <input type="checkbox"/> N			
		Heartburn		<input type="checkbox"/> Y <input type="checkbox"/> N			
		Eczema		<input type="checkbox"/> Y <input type="checkbox"/> N			
D	Asthma Medications	<input type="checkbox"/> SABA, <input type="checkbox"/> LABA, <input type="checkbox"/> ICS, <input type="checkbox"/> LTRA, <input type="checkbox"/> Anticholinergic, <input type="checkbox"/> Methylxanthines, <input type="checkbox"/> Anti-IgE, <input type="checkbox"/> others					
E	List of Possible Triggers			Presence			
	Viral respiratory infections			<input type="checkbox"/> Y <input type="checkbox"/> N			
	Pollens			<input type="checkbox"/> Y <input type="checkbox"/> N			
	Dust mite, Molds,			<input type="checkbox"/> Y <input type="checkbox"/> N			
	Animal dander / secretions			<input type="checkbox"/> Y <input type="checkbox"/> N			
	Cold weather / raining			<input type="checkbox"/> Y <input type="checkbox"/> N			
	Food (shrimps, peanuts, ...), Smoking.			<input type="checkbox"/> Y <input type="checkbox"/> N			
F	Asthma Symptoms related to exercise			<input type="checkbox"/> Y <input type="checkbox"/> N			
G	Asthma symptoms related to exposure to work environment			<input type="checkbox"/> Y <input type="checkbox"/> N			
H	Other Medication List:	<input type="checkbox"/> NSAIDS, <input type="checkbox"/> Aspirin, <input type="checkbox"/> ACE , <input type="checkbox"/> Beta Blocker		<input type="checkbox"/> Y <input type="checkbox"/> N if Y tick the drug			
I	Co morbid conditions:	<input type="checkbox"/> Heart failure, <input type="checkbox"/> depression, <input type="checkbox"/> Pregnancy, <input type="checkbox"/> smoking, <input type="checkbox"/> BMI					
J	Family History of Asthma or atopy (skin, eye, nose)			<input type="checkbox"/> Y <input type="checkbox"/> N			
K	Examination						
	Vital Signs	Pulse:	RR:	O2 sat:	BP:	Temp:	Height:
			Use of Accessory Respiratory Muscles			<input type="checkbox"/> Y <input type="checkbox"/> N	
	Chest		Vesicular breathing			<input type="checkbox"/> Y <input type="checkbox"/> N	
			Wheezes			<input type="checkbox"/> Y <input type="checkbox"/> N	
L	Initial Work up						
	Chest X-ray: if alternative diagnosis is considered.						
	spirometer (FEV1, FVC, FEV1/FVC) if not available do PEFr						

Section A: shall ascertain degree of asthma control based on criteria in table #2&3.
 Section B: Assess the further risk :
 Section C: associated factors that might prevent asthma control: allergic rhinitis, Gastro -esophageal Reflux Disease.
 Section D: history of asthma medication.
 Section E: identify possible environmental triggers that need to be avoided.
 Section F: Clues toward exercise induced asthma.
 Section G: Clues toward occupational asthma or asthma worsening at work.
 Section H: list of medication that can worsen asthma symptoms or mimic asthma symptoms.
 Section I: co morbidities that need to be treated beside or ruled out beside asthma.
 Section K: Examination section that include ACT score, Peak Expiratory Flow Rate, Signs of allergic rhinitis, Eczema.

The diagnosis of asthma can be ascertained by using the following probability criteria:

Table 2. Probability of asthma criteria:

High Probability	Low probability
More than 1 of the component symptoms (Table.1.A)	Isolated cough in the absence of wheeze or difficulty breathing
Relation of symptoms to triggers (Table.1.A)	Normal findings (physically and on PFT) while symptomatic
Personal history of atopic disorder (Table.1.C)	No response to a trial of asthma therapy
Family history of atopic disorder and/or asthma(Table.1..J)	Clinical features pointing to alternative diagnosis
Wheeze heard on auscultation (Table.1.K)	
History of improvement in (symptoms/lung function) in response to adequate therapy (Table1.A).	Intermediate probability: Does not fit either high or low probability.

Once, the diagnosis of asthma becomes high probability, proceed to the next steps of the guideline.

High Probability of asthma:

Start management;

Low Probability:

Other diagnosis likely, or No alternative diagnosis, or Not sure about the cause of patients symptoms THEN Refer to specialist , within the PHCC or in the hospital.

Intermediate:

Trial of asthma therapy for (4-8 weeks) AND if no response or diagnosis is uncertain, THEN Refer to specialist , within the PHCC or in the hospital.

Step.2 Assess Degree of asthma control:

The physician shall combine the outcome of Table.1 and the score of Asthma Control Test (ACT) questionnaire to classify degree of asthma control. ACT can be answered by the patient and/or guardian while waiting to be seen by the doctor would be helpful in the evaluation, see appendix #.1. The outcome of this step is to classify patient into controlled, partially controlled, uncontrolled asthmatic.

Table 3 **Assessment of asthma control in adult and children > 5 years:**

Component of Control	Classification of Asthma Control		
	Controlled	Partially Controlled	Uncontrolled
Symptoms	None or less than twice a week	More than twice a week	Throughout the day
Nighttime awakening	none or once a month	two or more flare-ups a month	two or more flare-ups a week
Effect on daily activities	none	Some limitations	Extremely limited
short acting beta2-agonist for symptoms relief (not including pre-exercise prophylaxis)	≤ 2 days/week	more than twice/week	Several times a day
FEV ₁ or peak flow	> 80% of predicted/personal best	60-80% of predicted/personal best	< 60% of predicted/personal best
Validated questionnaire: ACT Score	≥ 20	16-19	< 16
Exacerbation (requiring oral steroids or hospitalization)	0	one flare-up per year	Two or more flare-ups per year

Table 4 **Assessment of asthma control in children < 5 years:**

Characteristics	Controlled (All of the following)	Partly Controlled (Any measure present in any week)	Uncontrolled (Three or more of features of partly controlled asthma in any week)
Daytime symptoms: Wheezing, cough, difficult breathing	≤ Twice/week (less than twice/week, typically for short periods on the order of minutes and rapidly relieved by the use of a rapid-acting bronchodilator)	More than twice/week (typically for short periods on the order of minutes and rapidly relieved by use of a rapid-acting bronchodilator)	More than twice/week (typically last minutes or hours or recur, but partially or fully relieved with rapid-acting bronchodilator)
Limitation of activities	None (child is fully active, plays and runs without limitation or symptoms)	Any (may cough, wheeze, or have difficulty breathing during exercise, vigorous play, or laughing)	Any (may cough, wheeze, or have difficulty breathing during exercise, vigorous play, or laughing)
Nocturnal symptoms/awakening	None (including no nocturnal coughing during sleep)	Any (typically coughs during sleep or wakes with cough, wheezing, and/or difficult breathing)	Any (typically coughs during sleep or wakes with cough, wheezing, and/or difficult breathing)
Need for reliever/rescue treatment	≤ 2 days/week	>2 days/week	>2 days/week

Subsequently put down your management plan which should aim at:

- Control asthma symptoms by achieving Asthma Control Test (ACT) score ≥20.
- Maintain normal daily and exercise activities on minimal medications.
- Minimize or prevent ED visit.

Asthma Control:

It is the control of airway hyper-responsiveness, through medications and triggers control.

Step.3. Set up a Management Plan:

Once diagnosis and the degree of control are ascertained, Management plan should be done. It covers the following aspects:

1. Inform Patient /Family about the diagnosis.
2. Education about asthma as a disease.
3. Available options of medications and what can be better for the patient.
4. How can the patient/family minimize exacerbations?
5. How do patient/family deals with worsening symptoms (action plan).
6. How would the patient communicate with the treating physician?
7. How frequent is going to be seen in the clinic?
8. What kind to procedure shall he have in the future?
9. What should he do if he runs out of medications?
10. When to go to ED?

The last issue in the management plan is to give the patient/ family a chance to ask further questions.

Step 4. Prescribe appropriate asthma medication:

New patient (first visit), If he is classified as controlled an inhaled short-acting beta₂ agonist should be used as needed. If a rescue beta₂ agonist is needed more than 2 times per week (excluding preventative use prior to exercise) or if lung function is abnormal i.e. partially controlled, an inhaled glucocorticosteroid is the next step. If the patient is classified as uncontrolled asthmatic low does ICS combined with LABA.

The patient can be requested to come back after two weeks or four weeks depending on clinical assessment. In the follow up visit the anti-asthma treatment can be stepped-up or stepped down as per table 4.

Table 5 **stepwise approach to managing asthmatic:**

	Controlled	Partially	Uncontrolled
NEW Patient	Recommendation: 1. SABA PRN	Recommendation: 1. Low dose ICS (first Choice) 2. Alternative LTRA (Second choice)	Recommendation: 1. Low to medium dose ICS PLUSE LABA (first choice) 2. Alternative <ul style="list-style-type: none"> a) Medium to High dose ICS (second choice) b) Low to medium dose ICS PLUSE LTRA (third choice) c) Low to medium ICS + Theophylline (third choice).
Follow UP	Recommendation: 1. Maintain the same Rx and consider stepping down if the disease stable for few months	Step up therapy by increase ICS dose or by adding LABA or LTRA or both: 1-Increase ICS to next level e.g., (from low to medium, or from medium to high) dose ICS +LABA (first choice) 2- Increase the dose to next level of ICS + LTRA (second choice) 3-Increase the dose to next level of ICS + Theophylline (third choice) Considering stepping down after gaining control for 3 months	Step up therapy by increase ICS dose and by adding LABA or LTRA both 1- Increase ICS to next level e.g. (from Medium to High) dose ICS + LABA + LTRA (first choice) 2- Add PO Steroid short course to gain control Refer to specialist if the patient still not controlled or require high and frequent doses of PO steroid Considering stepping down after gaining control for 3 months

Regardless of which inhaler you prescribed to your patient, the most important **is the proper use** of how the patient use **inhaler device**. For proper use of MDI, it should be used with spacer “aero chamber”. For adults, however, a dry powdered inhaler (DPI) has demonstrated efficacy and is more convenient for most people. Teaching the patient of how to use the inhaler device properly is very important and has to be reviewed and checked every clinic visit. To minimize oral thrush, patient should be instructed about proper mouth wash and gargling post ICS use.

The Inhaled corticosteroids available in the Saudi are included in the following table:

Table 6 .List of equipotent daily doses in micrograms (µg) of the ICS (Children)

Drug	Less than 5 years	Children above 5 years		
	Low dose	Low dose	Medium dose	High dose
Beclomethasone Dipropionate	100	100 - 200	>200 - 400	>400
Budesonide	200 (Nebulizer=500)	250 - 500	>500 – 1000	>1000
Ciclesonide	Not studied	80 - 160	>160 - 320	>320
Fluticasone propionate	100	100 - 200	>200 - 500	>500

Table 7. List of equipotent daily doses in micrograms (µg) of the ICS (adult);

Drug	Low dose	Medium dose	High dose
Beclomethasone Dipropionate	200 - 500	>500 - 1000	>1000 - 2000
Budesonide	200 – 400	>400 – 800	>800 - 1600
Ciclesonide	80 - 160	>160 - 320	>320 - 1280
Fluticasone propionate	100 - 250	>250 - 500	>500 - 1000

Step.5. Perform Patient/Family education:

Patient /family should understand the nature of the asthma as a chronic disease that require a close monitoring, and great degree of compliance with medical instructions. The medical instructions include asthma medication compliance and technique, use of asthma action plan, and avoidance of exposure to triggers..

The patient has to be instructed clearly in how to use his/her asthma medications, It is necessary that patient demonstrate appropriate technique of using his medication prior leaving the clinic. The patient (or parents) should be educated in how to use self-management plans (see Appendix # 4 asthma action plan), and can comprehend the instructions.

The patient should be encouraged to avoid exposure to triggers. Complete avoidance of environmental tobacco smoke is strongly recommended

1. Environmental allergens, indoor : e.g., mold, house-dust mite, cockroach, animal dander
2. Reduce dampness by cleaning, avoid animals and use pesticide for insects. Wash bed linen and blankets weekly with hot water.
3. Exercise: Take medication before exercise
4. Irritants: tobacco smoke: Avoid both active and passive smoking.
5. Drugs e.g., aspirin; and other non-steroidal anti-inflammatory drugs, beta-blockers including eye drops etc ..Caution with these medication (weight risks and benefits).
6. Food, food additives: Avoid if known to cause asthma.
7. Changes in weather, exposure to cold airAvoid exposure.

Step 6. Give a Follow up Visit.

1. The follow up frequency depends on the degree of asthma control, (1- 3 months) after starting treatment (we need to see patient earlier) once patient controlled then clinic visit every 3 months
 2. after acute exacerbation patient need to be seen within one week.
- Every asthma consultation is an opportunity to review, reinforce and extend both knowledge and skills.

At each follow up visit conduct the following:

3. Review the **ACT** score and assess degree of asthma control.
4. Adjust asthma medication.
5. Check the technique of how the patient using his medication device (inhaler).
6. Assess compliance:
 - a. Check the frequency of asthma therapy use in the past 2 weeks.
 - b. Check inhaler's counter if available.
7. Review the avoidance of exposure to triggers (Environmental control measure).
8. Refer whenever indicated.

Referral Guidelines for asthma specialist:

Children and adults with asthma or suspected asthma should be referred to the asthma clinic for the following indications:

1. Exercise induced symptoms that are atypical or not responding to pre-treatment with bronchodilators
2. Suspected asthma is not confirmed especially with normal pulmonary function tests.
3. Evaluation of inhalant (e.g. pollens or animal dander) sensitization to confirm the triggers and provide education regarding avoidance measures.
4. Patients with bronchial asthma but difficult to control
5. Patients with a prior life-threatening episode or prior intubation.
6. Failure to respond to conventional treatment & Possibility of requiring advanced therapy such as Immunotherapy.
7. Patient with major co- morbidity that need experience in the management by specialist.

ACUTE ASTHMA

Asthma patient should be evaluated based by combining clinical examination and measuring flow rates (FEV1/FVC ratio or PEFR). The following table is used to guide the therapy in ED. Patient who has severe and life threatening should be immediately given the recommended medications and arrange transfer to a tertiary hospital.

Table.8. Classification of asthma in ED

	Symptoms and Signs	Initial PEF (or FEV1)	Clinical Course
Mild	<ul style="list-style-type: none"> - Dyspnea only with activity (assess tachypnea in young children) - No accessory muscle use - End expiratory wheezing - SaO₂ > 95% 	<ul style="list-style-type: none"> - PEF ≥ 70 percent predicted or personal best 	<ul style="list-style-type: none"> - Usually cared for at home - Prompt relief with inhaled SABA - Possible short course of oral systemic corticosteroids
Moderate	<ul style="list-style-type: none"> - Dyspnea interferes with or limits usual activity - Accessory muscle use - End expiratory wheezing - SaO₂ 90-95% 	<ul style="list-style-type: none"> - PEF 40–69 percent predicted or personal best 	<ul style="list-style-type: none"> - Usually requires office or ED visit - Relief from frequent inhaled SABA - Oral systemic corticosteroids: some symptoms last for 1-2 days after treatment is begun
Severe	<ul style="list-style-type: none"> - Dyspnea at rest; interferes with conversation - Accessory muscle use - Insp./Exp. Wheezing - SaO₂ < 90% 	<ul style="list-style-type: none"> - PEF <40 percent predicted or personal best 	<ul style="list-style-type: none"> - Usually requires ED visit and likely hospitalization - Partial relief from frequent inhaled SABA - Oral systemic corticosteroids: some symptoms last for >3 days after treatment is begun - Adjunctive therapies are helpful
Life threatening	<ul style="list-style-type: none"> - Too dyspneic to speak: perspiring - Drowsy or confused - Silent chest 	<ul style="list-style-type: none"> - PEF < 25 percent predicted or personal best 	<ul style="list-style-type: none"> - Requires ED/hospitalization: possible ICU - Minimal or no relief from frequent inhaled SABA - Intravenous corticosteroids - Adjunctive therapies are helpful
<p>Key: ED, emergency department: FEV1, forced expiratory volume in 1 second: ICU, intensive care unit: PEF, peak expiratory flow: SABA, short-acting beta2-agonist</p>			

Table.9. Medications doses in acute asthma

Medication	Child dose	Adult dose
Albuterol (salbutamol) - Nebulizer solution	2.5 mg/dose if ≤ 20 kg body weight 5 mg/dose if > 20 kg body weight	5 mg/dose
- MDI (100 mcg/Puff)	4 Puffs/dose ≤ 20 kg 8 Puffs/dose > 20 kg	8 Puffs/dose
Ipratropium bromide - Nebulizer solution	0.25 mg/dose	0.5 mg/dose
- MDI (18 mcg/Puff)	4 Puffs/dose	8 Puffs/dose
- Prednisone - Prednisolone - Methylprednisolone	2 mg/kg (max. 60 mg/ day) in 1-2 divided doses	60 mg/day in 1-2 divided doses

Patients with acute asthma with the following history are at increased risk of death:

- Previous intubation or ICU admission.
- Two or more hospitalizations or more than 3 ED visits in the past year.
- Use of > 1 canister of SABA/month.
- Current use or recent stopping of chronic oral glucocorticoids.
- Major psychosocial problems or psychiatric disease.

References:

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