Bronchial Asthma in Adults Clinical Guidelines

Definition

Asthma is a chronic heterogeneous disease usually characterized by chronic airflow limitation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation.

The SINA panel stratified the guidelines based on the following age groups: adults: age 11 above 18 years; adolescents: age of 13 to 18 years; and children that were stratified into two groups: age of 5 to 12 years and age below 5 years.

Assessment (History and Examination)

1. Diagnosis of Asthma in Adults and Adolescents

The diagnosis of asthma is based on clinical assessment by a detailed history and physical examination supported by spirometry with reversibility testing.

History:

The symptoms of asthma are wheezing, cough, shortness of breath, and chest tightness but they are not specific for asthma and can be seen with other pulmonary diseases. However, the combination of these symptoms increases the probability of asthma. The pattern of symptoms is usually variable over time and the patient may be entirely asymptomatic between attacks. Symptoms are usually worse at night, particularly in children, and can be provoked by exercise or other triggering factors such as viral infections and or smoke. Asthma diagnosis can be supported by taking detailed history including patient's occupation, family history of asthma, other allergic disorders, and smoking and vaping. Asthma control may be worsened by coexisting symptomatic gastro-esophageal reflux disease (GERD), rhinosinusitis, obesity, sleep disorders, or the use of some medications such as beta blockers and nonsteroidal anti-inflammatory drugs (NSAIDs) including aspirin (ASA). Asthma and rhinosinusitis commonly coexist.

Box 3.1: Relevant Questions in the Diagnosis of Asthma
• Does the patient or his/her family have a history of asthma or other atopic conditions, such as eczema or allergic rhinitis? • Does the patient have recurrent attacks of wheezing? • Does the patient have a troublesome cough at night? • Does the patient wheeze or cough after exercise? • Does the patient experience wheezing, chest tightness, or cough after exposure to pollens, dust, feathered or furry animals, exercise, viral infection, or environmental smoke (cigarettes, burning incense "Bukhoor," or wood)? • Does the patient experience worsening of symptoms after taking aspirin/nonsteroidal anti-inflammatory medication or use of B-blockers? • Does the patient's colds "go to the chest" or take more than 10 days to clear up? • Are symptoms improved by appropriate asthma treatment? • Are there any features suggestive of occupational asthma?

Physical Examination:

The physical examination of the chest may be normal in stable and controlled asthma but the presence of bilateral expiratory widespread, high-pitched, variable musical wheezing, is a characteristic feature of asthma. This may be accompanied by shortness of breath or diminished oxygen saturation. Examination of the upper airways is important to look for evidence of allergic rhinitis, such as nasal mucosal swelling, nasal polyps, and postnasal dripping. Other allergic manifestations, such as atopic dermatitis, also support the diagnosis of allergic asthma. The presence of a localized wheeze, crackles, stridor, clubbing, or heart murmurs should suggest alternative diagnoses.

Investigations:

Spirometry is necessary to confirm airflow obstruction and demonstrates significant reversibility by performing a spirometry. The degree of significant reversibility is defined as an improvement in FEV1 ≥12% and ≥ 200 ml from the pre-bronchodilator value. It may also help to identify other alternative diagnoses such as upper airway obstruction. However, normal spirometry or failure to show reversibility does not rule out the diagnosis of asthma, as it can be normal with the patient still being symptomatic. Serial peak expiratory flow rate (PEF) measurements may be helpful in the diagnosis of asthma by showing the characteristic increased variability and for follow-up after starting treatment. Bronchoprovocation testing is another tool to rule out asthma with atypical presentation and normal spirometry but it is not routinely required. A diagnostic therapeutic trial with an ICS and a bronchodilator combination may be useful in confirming a diagnosis when it shows a favourable response.

Chest X-ray is not routinely recommended unless the diagnosis is in doubt, when symptoms are not typical, or suggest alternative diagnoses. Peripheral eosinophilia and elevated IgE level are supportive of the diagnosis but are not routinely recommended unless dealing with moderate to severe asthma. Exhaled nitric oxide is an alternative method for detecting airway inflammation in eosinophilic asthma, but it is not widely available and can be suppressed with the use of inhaled corticosteroids (ICS) in smokers. Skin prick testing and radioallergosorbent test (RAST) may be helpful in identifying allergens to which the patient has been sensitized and in developing a strategy for avoiding allergen exposure.

2. Clinical Assessment in Adults and Adolescents

Principles of asthma assessment:

The principles of optimal asthma management is recommended to initially consist of an assessment of asthma control. Prior to commencing a patient on treatment, the SINA panel recommends ensuring the following:

- Assessment of asthma control.
- Assessment of risk factors for poor asthma control and fixed airway obstruction
- Performance of pulmonary function testing with spirometry and/or PEF to assess for airflow limitations and postbronchodilator reversibility.
- Documentation of current treatment and any issues related to adherence, inhaler technique, or side effects.
- Utilization of a written asthma action plan.
- Assessment of comorbidities such as rhinosinusitis, gastroesophageal reflux disease (GERD), obesity, obstructive sleep apnoea, anxiety, and exercise-induced laryngeal obstruction.
- Close monitoring for patients with severe asthma and history of asthma attacks.

Assessment of asthma symptoms control

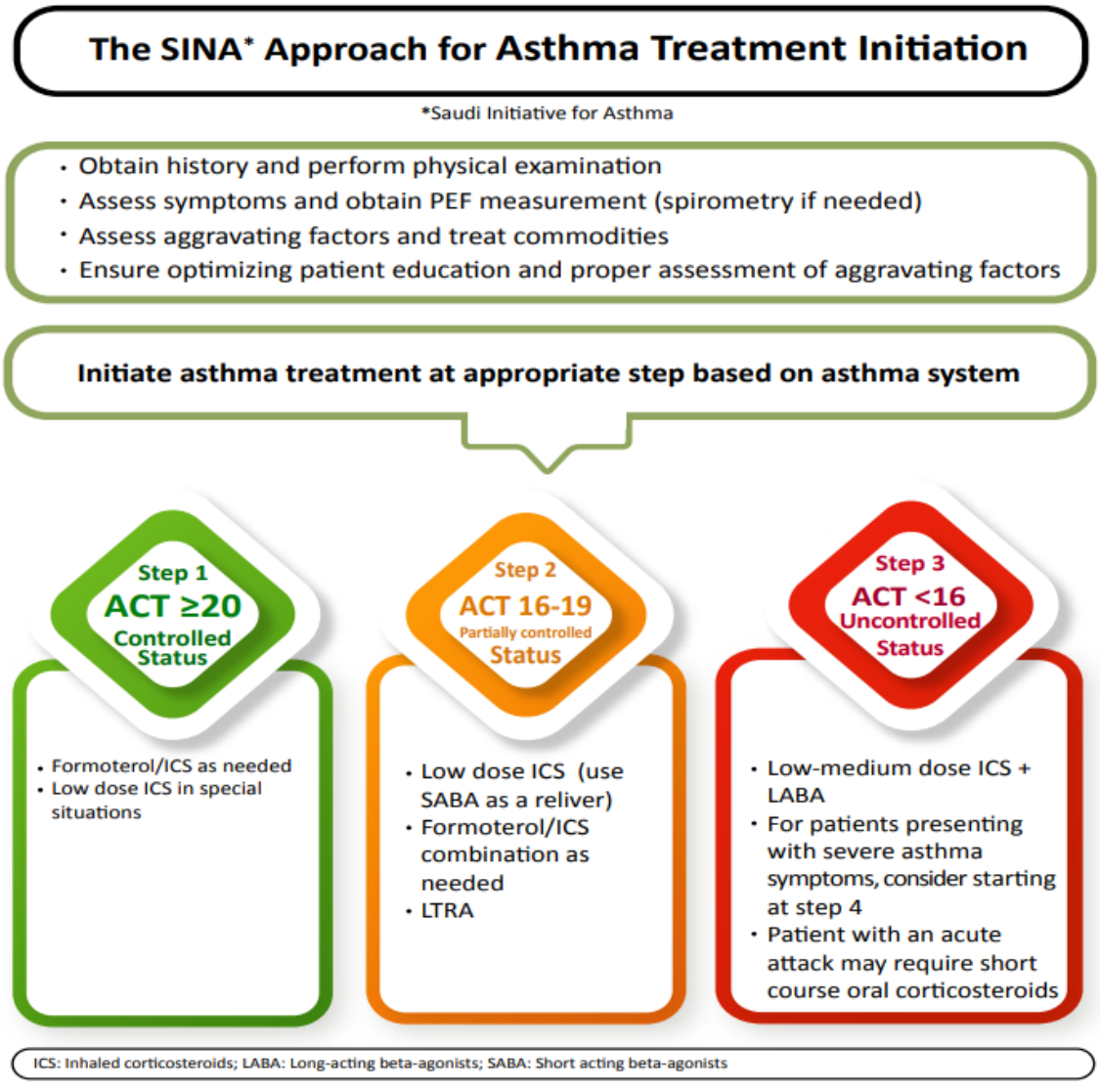
The level of asthma control is categorized into:

- Controlled: An ACT score of ≥20
- Partly controlled: An ACT score of 16-19
- Uncontrolled: An ACT score of <16

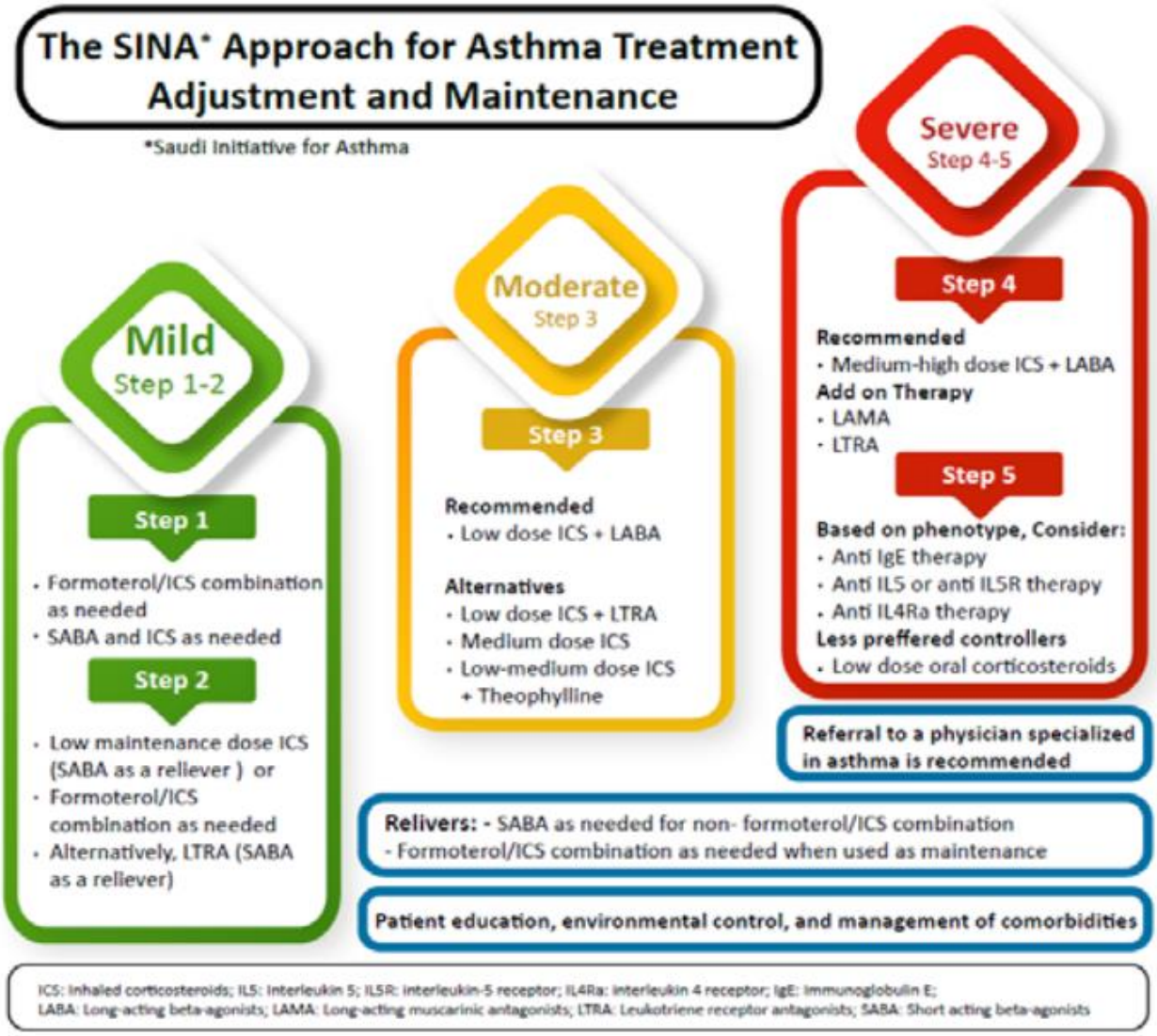
Asthma Control Test items					Score
1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, at school, or at home?					
All of the time	Most of the time	Some of the time	A little of the time	None of the time	
□ 1	□ 2	□ 3	□ 4	□ 5	
2. During the past 4 weeks, how often have you had shortness of breath?					
More than once a day	Once a day	3–6 times a week	Once or twice a week	Not at all	
□ 1	□ 2	□ 3	□ 4	□ 5	
3. During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness, or pain) wake you up at night, or earlier than usual in the morning?					
4 or more nights a week	2 to 3 nights a week	Once a week	Once or twice	Not at all	
□ 1	□ 2	□ 3	□ 4	□ 5	
4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication such as salbutamol?					
3 or more times per day	1 or 2 times per day	2 or 3 time per week	Once a week or less	Not at all	
□ 1	□ 2	□ 3	□ 4	□ 5	
5. How would you rate your asthma control during the past 4 weeks?					
Not controlled at all	Poorly controlled	Somewhat con-trolled	Well controlled	Completely controlled	
□ 1	□ 2	□ 3	□ 4	□ 5	
				TOTAL SCORE	
*Adapted from reference number (75)					

Management

Box 6.1: Initiation of asthma treatment for adults and adolescents



Box 6.2: Outpatient asthma treatment for adults and adolescents



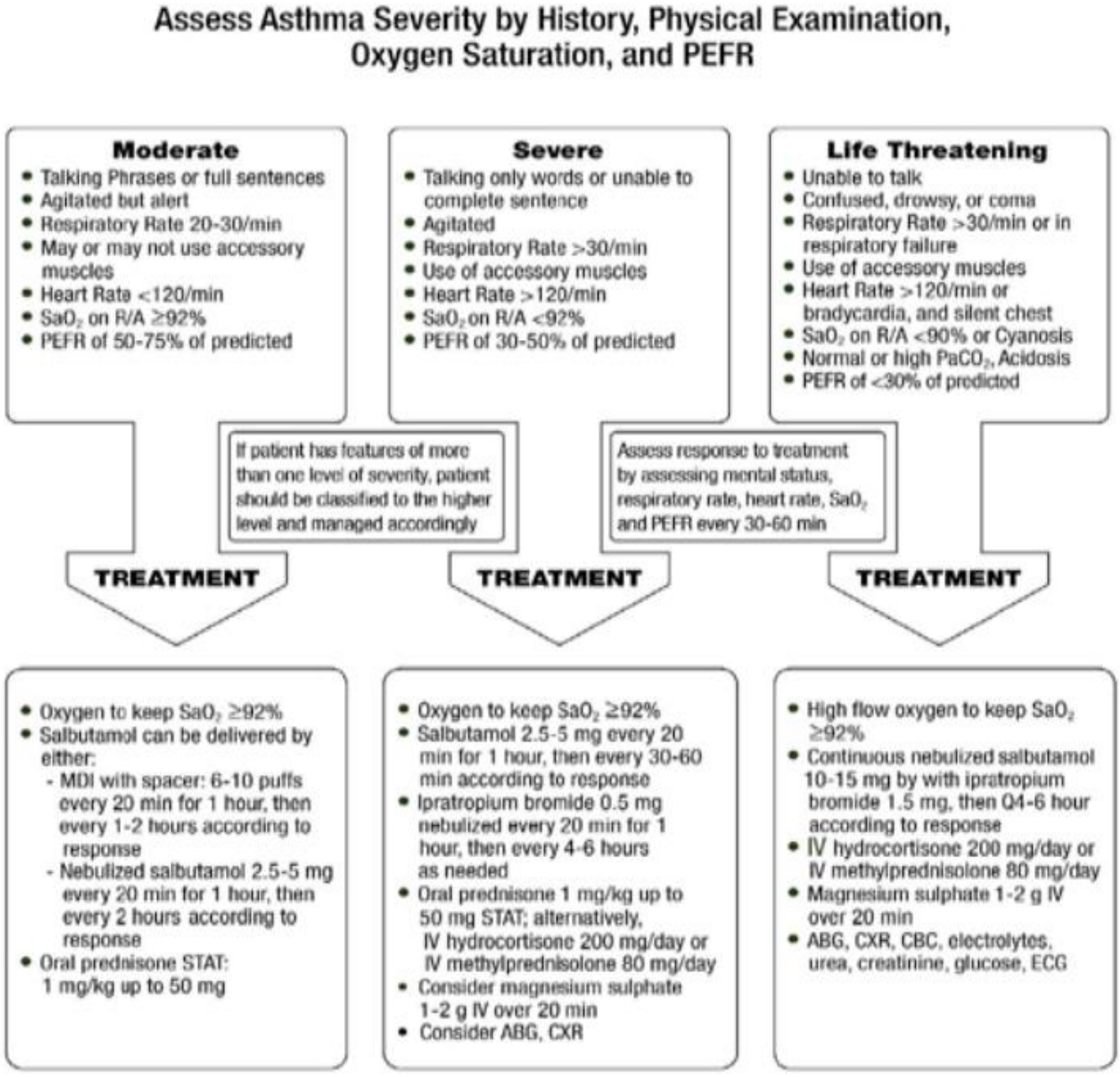
Management of Acute Asthma in Adults and Adolescents

Box 7.1 Key recommendations of acute asthma management
• Assess the severity of the attack based on the degree of dyspnea, pulse rate, respiratory rate, peak-expiratory flow rate, and oxygen saturation • Start treatment immediately by repeated administration of salbutamol, controlled oxygen concentration and systemic steroid • Review response to treatment after 1 hour of continuous therapy • Consider other therapy (ipratropium bromide and magnesium sulfate) in severe attacks • DO NOT request routine CXR or blood gases routinely unless indicated • DO NOT prescribe routine antibiotics or sedatives • Evaluate the need of hospital admission based on response to therapy, history of previous admission, and the ability to manage at home

Box 7.2: Levels of severity of acute asthma in adults	
Level	**Characteristics**
Moderate asthma attacks	• Increasing symptoms • PEF >50 – 75% best or predicted reading • No features of acute severe asthma
Acute severe asthma	• Any one of the following: o PEF 30 – 50% best or predicted reading o Respiratory rate ≥25/min o Heart rate ³120/min • Inability to complete sentences in one breath
Life-threatening asthma	• Any one of the following in a patient with severe asthma: o SpO2<92% (PaO2<60 mmHg) on high-flow FIO2 o PEF <30% best or predicted o Bradycardia o Dysrhythmia o Cyanosis o Hypotension o Normal or high PaCO2 o Exhaustion o Confusion o Silent chest o Coma • Weak respiratory effort
Near-fatal asthma	• Raised $PaCO_2$ and/or requiring mechanical ventilation
Brittle asthma	• Type 1: Wide PEF variability (>40% diurnal variation for >50% of the time over a period of >3–6 months) despite intense therapy • Type 2: Sudden severe attacks on a background of apparently well-controlled • asthma

PEF=Peak expiratory flow

Initial management of acute asthma for adults and adolescents:



Adjustment of acute asthma treatment for adults and adolescent

Reassess Asthma Severity by History, Physical Examination, Oxygen Saturation, and PEFR

Adequate Response

- Improving symptoms and stable vital signs
- PEFR >60% of predicted
- SaO_2 ≥92%
- Adequate response to be maintained for at least 4 hours
- Continue brochodilators for 1-4 hour PRN
- Continue oral prednisone for 5-7 days

Upon Discharge

- Ensure stable on a 4 hourly inhaled bronchodilator
- Prescribe combination of inhaled steroids/LABA
- Review inhaler technique and encourage compliance
- Ensure adequate rescue treatment
- Provide written asthma self-management action plan
- Arrange follow up in pulmonary clinic or primary care clinic within a few days

Partial Response

- Minimal improvement of respiratory symptoms
- Stable vital sings
- SaO_2 ≥92% on oxygen therapy
- PEFR 30-50% of predicted
- Continue brochodilators therapy (salbutamol with ipratropium bromide) every 1-4 hour

What is next?

- Continue oral prednisone 1mg/kg (maximum dose 50mg) daily; alternatively, IV hydrocortisone 200 mg/day or IV methylprednisolone 80 mg/day
- Observe closely for any signs of fatigue or exhaustion
- Monitor O_2 saturation and PEFR
- If the patients is responding, follow "adequate response" track
- If there is no adequate response after 4 hours, consider admission

Poor Response

- No improvement of respiratory symptoms
- Signs of fatigue or exhaustion
- PEFR <30% of predicted
- SaO_2 <92% with high flow oxygen
- ABG shows respiratory acidosis and/or rising $PaCO_2$

What is next?

- Continue bronchodilators and systematic steroids
- ICU consultation for possible admission

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