In the name of God

Clinical Features and Diagnosis of Asthma

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Patterns of respiratory symptoms

- Wheezing
- Shortness of breath
- Cough
- Chest tightness
- Patients experience more than one symptoms
- Symptoms worse at night or early in the morning
- Symptoms Vary over the time and in intensity
- Symptoms triggered by Cold, vital infection, fumes, smoke, laughter, allergens, change in weather, and strong smells

Features decrease the possibility of Asthma

- Isolated cough with no other symptom
- Chronic production of sputum
- Shortness of breath associated with dizziness, peripheral paresthesia and light headedness

Physical examination

- Usually is normal
- The most finding: Expiratory wheezing (rhonchi) may be absent or only heard on forced expiration
- Wheezing may be absent during server asthma exacerbations due to severely reduced airflow(silent chest)

Diagnostic Criteria

- 1. History of Typical variable respiratory symptoms
- 2. Confirmed variable expiratory airflow limitation
    - Documented expiratory airflow limitation
    - Documented excessive variability in lung function

2. CONFIRMED VARIABLE EXPIRATORY AIRFLOW LIMITATION	
Feature	*Considerations, definitions, criteria*
1. Documented* excessive variability in lung function* (one or more of the following):	The greater the variations, or the more occasions excess variation is seen, the more confident the diagnosis. If initially negative, tests can be repeated during symptoms or in the early morning.
• Positive bronchodilator (BD) responsiveness (reversibility) test	*Adults*: increase in FEV_1 of >12% and >200 mL (greater confidence if increase is >15% and >400 mL). *Children*: increase in FEV_1 from baseline of >12% predicted. Measure change 10–15 minutes after 200–400 mcg salbutamol (albuterol) or equivalent, compared with pre-BD readings. Positive test more likely if BD withheld before test: SABA ≥4 hours, twice-daily LABA 24 hours, once-daily LABA 36 hours
• Excessive variability in twice-daily PEF over 2 weeks	*Adults*: average daily diurnal PEF variability >10%* *Children*: average daily diurnal PEF variability >13%*
• Increase in lung function after 4 weeks of treatment	*Adults*: increase in FEV_1 by >12% and >200 mL (or PEF† by >20%) from baseline after 4 weeks of ICS-containing treatment, outside respiratory infections
• Positive exercise challenge test	*Adults*: fall in FEV_1 of >10% and >200 mL from baseline *Children*: fall in FEV_1 of >12% predicted, or PEF >15% from baseline
• Positive bronchial challenge test (usually only for adults)	Fall in FEV_1 from baseline of ≥20% with standard doses of methacholine, or ≥15% with standardized hyperventilation, hypertonic saline or mannitol challenge
• Excessive variation in lung function between visits (good specificity but poor sensitivity)	*Adults*: variation in FEV_1 of >12% and >200 mL between visits, outside of respiratory infections. *Children*: variation in FEV_1 of >12% in FEV_1 or >15% in PEF† between visits (may include respiratory infections)
AND	
2 Documented* expiratory airflow limitation	At a time when FEV_1 is reduced (e.g. during testing above), confirm that FEV_1/FVC is also reduced compared with the lower limit of normal (it is usually >0.75–0.80 in adults, >0.90 in children[21])

- **PEF variability:**

([Day's highest – day's lowest]/mean of Day's highest and lowest)*100

Other tests

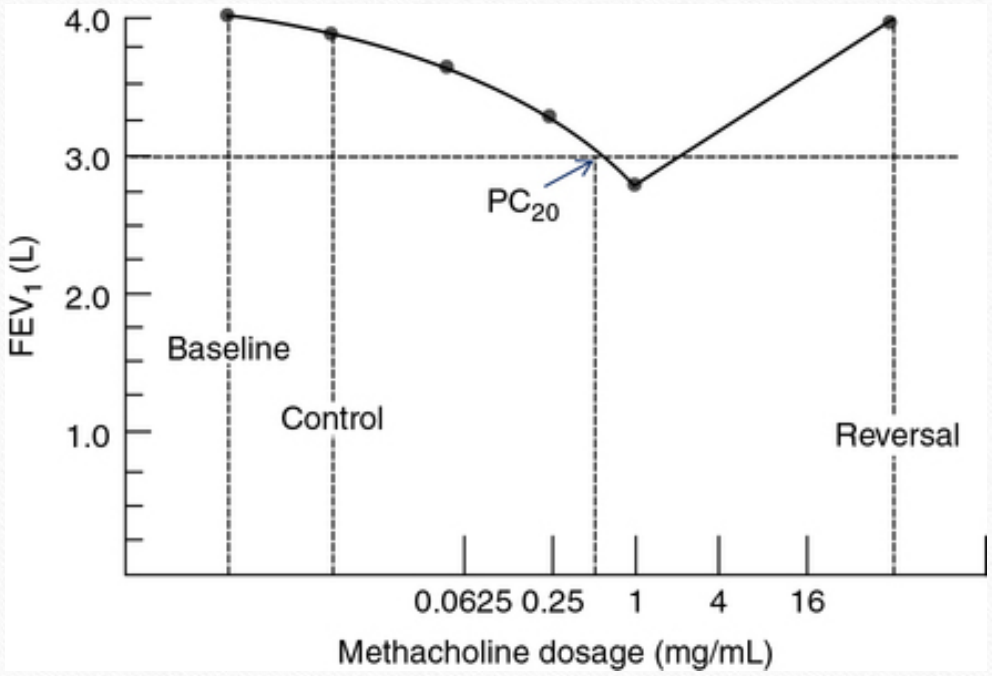
- Bronchial provocation test for evaluation of AHR
- Hematologic Tests
- Skin test
- Imaging
- Exhaled NO

Bronchial provocation test

- Mtacholin
- Histamin
- Exercise
- Eucapnic voluntary hyperventilation
- Inhaled Monnitol
- Allergen challenge is rarely necessary and should only be undertaken by a specialist if specific occupational agents are to be identified
- These test are moderately sensitive but have limited specificity
- It means that neg. test exclude asthma but post. test can not do it.

Bronchial provocation test

- The increased AHR is normally measured by methacholine or histamine challenge with calculation of the provocative concentration that reduces FEV1 by 20% (PC20).



Hematologic test

- Blood tests are not usually helpful.
- Total serum IgE and specific IgE to inhaled allergens (radioallergosorbent test [RAST]) may be measured in some patients

Imaging

- Chest roentgenography is usually normal but in more severe patients may show hyperinflated lungs.
- In exacerbations, there may be evidence of a pneumothorax.
- Lung shadowing usually indicates pneumonia or eosinophilic infiltrates in patients with bronchopulmonary aspergillosis (BPA).
- High-resolution CT may show areas of bronchiectasis in patients with severe asthma, and there may be thickening of the bronchial walls, but these changes are not diagnostic of asthma.

Skin Tests

- Skin prick tests to common inhalant allergens (house dust mite, cat fur, grass pollen) are positive in allergic asthma and negative in intrinsic asthma, but are not helpful in diagnosis. Positive skin responses may be useful in persuading patients to undertake allergen avoidance measures.

Exhaled NO

- As a noninvasive test to measure eosinophilic airway inflammation. The typically elevated levels in asthma are reduced by ICS, so this may be a test of compliance with therapy.
- It may also be useful in demonstrating insufficient anti-inflammatory therapy and may be useful in down-titrating ICS.
- However, studies in unselected patients have not convincingly demonstrated improved clinical outcomes and it may be necessary to select patients who are poorly controlled.

Why is it important to confirm the diagnosis?

- To avoid unnecessary treatment or overtreatment
- To avoid missing other important diagnoses

When can variable expiratory airflow limitation be documented?

- The diagnosis of asthma was less likely to be confirmed in patients who had not had lung function testing performed at the time of initial diagnosis
- It should be documented before treatment is started.
- Because variability usually decreases with ICS treatment

Confirming the diagnosis of Asthma in patients already on taking ICS

- 25-30% of patients in primary care can not be confirmed to have athma.
- The process of confirming depends on patient's symptoms and lung function

Diagnosis in patients already on controller treatment

Current status	Steps to confirm the diagnosis of asthma
Variable respiratory symptoms and variable airflow limitation	Diagnosis of asthma is confirmed. Assess the level of asthma control (Box 2-2) and review controller treatment (Box 3-5).
Variable respiratory symptoms but no variable airflow limitation	Consider repeating spirometry after withholding BD (4 hrs for SABA, 24 hrs for twice-daily ICS-LABA, 36hrs for once-daily ICS-LABA) or during symptoms. Check between-visit variability of FEV_1, and bronchodilator responsiveness. If still normal, consider other diagnoses (Box 1-5). *If FEV_1 is >70% predicted*: consider stepping down controller treatment (see Box 1-5) and reassess in 2–4 weeks, then consider bronchial provocation test or repeating BD responsiveness. *If FEV_1 is <70% predicted*: consider stepping up controller treatment for 3 months (Box 3-5), then reassess symptoms and lung function. If no response, resume previous treatment and refer patient for diagnosis and investigation.
Few respiratory symptoms, normal lung function, and no variable airflow limitation	Consider repeating BD responsiveness test again after withholding BD as above or during symptoms. If normal, consider alternative diagnoses (Box 1-5). Consider stepping down controller treatment (see Box 1-5): • *If symptoms emerge and lung function falls*: asthma is confirmed. Step up controller treatment to previous lowest effective dose. • *If no change in symptoms or lung function at lowest controller step*: consider ceasing controller, and monitor patient closely for at least 12 months (Box 3-7).
Persistent shortness of breath and persistent airflow limitation	Consider stepping up controller treatment for 3 months (Box 3-5), then reassess symptoms and lung function. If no response, resume previous treatment and refer patient for diagnosis and investigation. Consider asthma–COPD overlap (Chapter 5).

BD: bronchodilator; LABA: long-acting $beta_2$-agonist; SABA: short-acting $beta_2$-agonist. 'Variable airflow limitation' refers to expiratory airflow.

GINA 2022, Box 1-3

Box 1-4. How to step down ICS-containing treatment to help confirm the diagnosis of asthma

1. ASSESS

- Document the patient's current status including asthma control (Box 2-2, p.38) and lung function. If the patient has risk factors for asthma exacerbations (Box 2-2B), step down treatment only with close supervision.
- Choose a suitable time (e.g., no respiratory infection, not going away on vacation, not pregnant).
- Provide a written asthma action plan (Box 4-2, p.146) so the patient knows how to recognize and respond if symptoms worsen. Ensure they have enough medication to resume their previous dose if their asthma worsens.

2. ADJUST

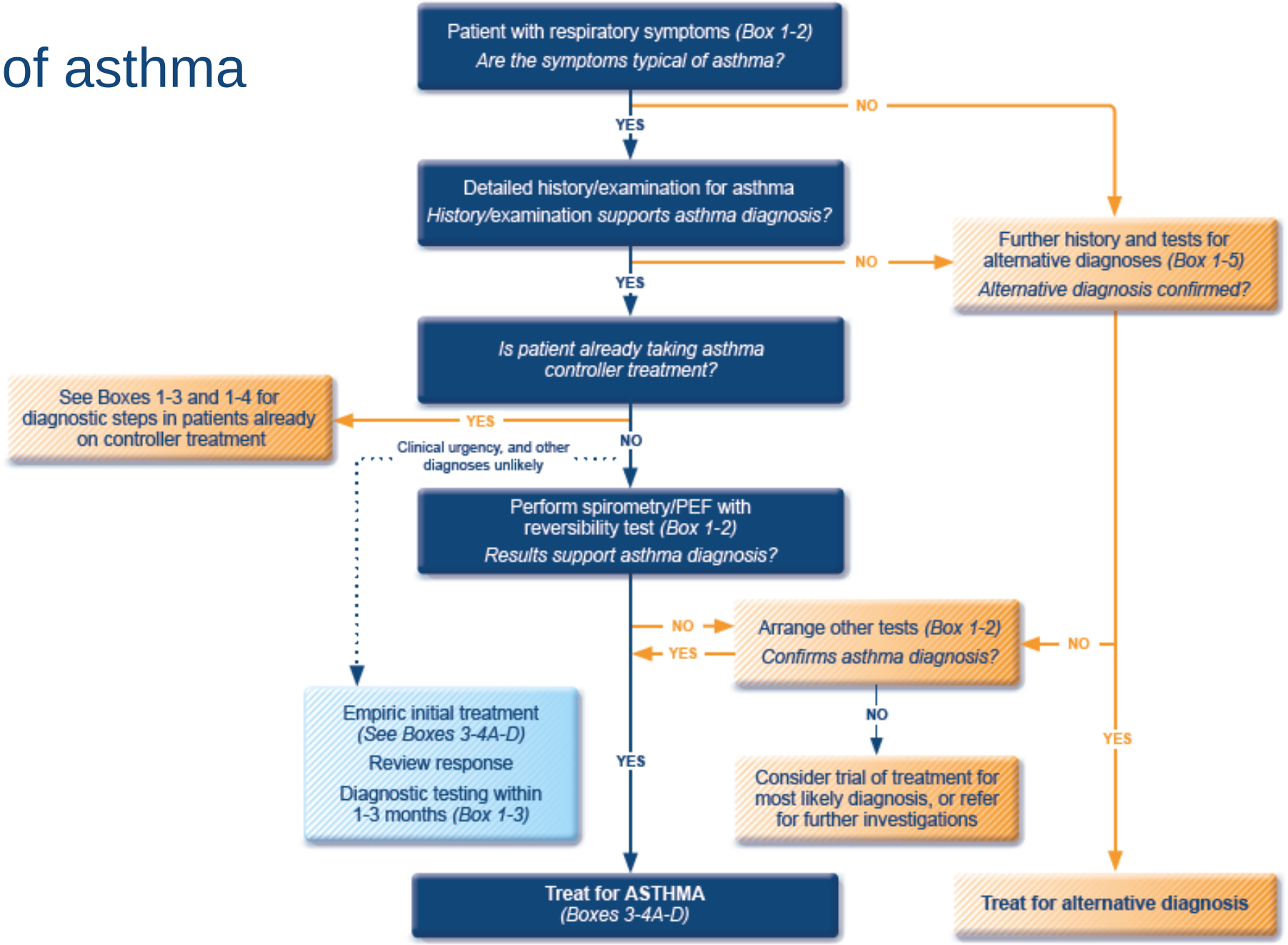
- Show the patient how to reduce their ICS dose by 25–50%, or stop other maintenance medication (e.g., LABA, leukotriene receptor antagonist) if being used. See step-down options in Box 3-16, p.83. Schedule a review visit for 2–4 weeks.

3. REVIEW RESPONSE

- Repeat assessment of asthma control and lung function tests in 2–4 weeks (Box 1-2, p.25).
- If symptoms increase and variable expiratory airflow limitation is confirmed after stepping down treatment, the diagnosis of asthma is confirmed. The patient should be returned to their lowest previous effective treatment.
- If, after stepping down to a low-dose ICS-containing treatment, symptoms do not worsen and there is still no evidence of variable expiratory airflow limitation, consider ceasing ICS-containing treatment and repeating asthma control assessment and lung function tests in 2–3 weeks, but follow the patient for at least 12 months.[23]

See list of abbreviations (p.21).

Diagnosis of asthma



Box 1-5. Differential diagnosis of asthma in adults, adolescents and children 6–11 years

Age	Symptoms	Condition
6–11 years	Sneezing, itching, blocked nose, throat-clearing	Chronic upper airway cough syndrome
	Sudden onset of symptoms, unilateral wheeze	Inhaled foreign body
	Recurrent infections, productive cough	Bronchiectasis
	Recurrent infections, productive cough, sinusitis	Primary ciliary dyskinesia
	Cardiac murmurs	Congenital heart disease
	Pre-term delivery, symptoms since birth	Bronchopulmonary dysplasia
	Excessive cough and mucus production, gastrointestinal symptoms	Cystic fibrosis
12–39 years	Sneezing, itching, blocked nose, throat-clearing	Chronic upper airway cough syndrome
	Dyspnea, inspiratory wheezing (stridor)	Inducible laryngeal obstruction
	Dizziness, paresthesia, sighing	Hyperventilation, dysfunctional breathing
	Productive cough, recurrent infections	Bronchiectasis
	Excessive cough and mucus production	Cystic fibrosis
	Cardiac murmurs	Congenital heart disease
	Shortness of breath, family history of early emphysema	Alpha$_1$-antitrypsin deficiency
	Sudden onset of symptoms	Inhaled foreign body
40+ years	Dyspnea, inspiratory wheezing (stridor)	Inducible laryngeal obstruction
	Dizziness, paresthesia, sighing	Hyperventilation, dysfunctional breathing
	Cough, sputum, dyspnea on exertion, smoking or noxious exposure	COPD*
	Productive cough, recurrent infections	Bronchiectasis
	Dyspnea with exertion, nocturnal symptoms, ankle edema	Cardiac failure
	Treatment with angiotensin-converting enzyme (ACE) inhibitor	Medication-related cough
	Dyspnea with exertion, non-productive cough, finger clubbing	Parenchymal lung disease
	Sudden onset of dyspnea, chest pain	Pulmonary embolism
	Dyspnea, unresponsive to bronchodilators	Central airway obstruction
All ages	Chronic cough, hemoptysis, dyspnea; and/or fatigue, fever, (night) sweats, anorexia, weight loss	Tuberculosis
	Prolonged paroxysms of coughing, sometimes stridor	Pertussis

See list of abbreviations (p.21). *For more detail, see Chapter 5 (p.159). Any of the above conditions may also contribute to respiratory symptoms in

Persistent non-productive cough

- Chronic upper airway cough syndrome(PND)
- Cough induced by ACE inhibitors
- GERD
- Chronic sinusitis
- Inducible laryngeal obstruction
- Cough-variant asthma vs. eosinophilic bronchitis

ACOS(Asthma-COPD overlapping syndrome)

- In older patients with history of smoking or biomass fuel exposure
- Six criteria:
- Three major : persistent airflow limitation, tobacco smoking and previous asthma or reversibility >400 mL FEV1)
- Three minor : history of atopy or rhinitis, at least two positive bronchodilator tests and □ 300 blood eosinophils per μL)

- 1.A patient with asthma who smokes may also develop non-fully reversible airflow obstruction, which differs from obstructive asthma and from “pure” COPD. This is the most frequent type of patient with ACO.
- 2. Some patients who smoke and develop COPD may have a genetic Th2 background (even in the absence of a previous history of asthma) and can be identified by high eosinophil counts in peripheral blood. These individuals could be included under the umbrella term of ACO.
- 3. A patient with COPD and a positive bronchodilator test (>200 mL and >12% FEV1 change) has reversible COPD but is not an asthmatic, or even ACO. 5) A patient with COPD and a very positive bronchodilator test (>400 mL FEV1 change) is more likely to have some features of asthma and could also be classified as ACO

Table Comparing

Asthma & Reactive Airway Disease

Characteristics	Asthma	Reactive airway disease
Definition	An inflammatory response of the airways and bronchial tubes	An irritation of the bronchial passages due to some irritant
Duration of the condition	Chronic, long-term	Acute, usually only one occurrence
Diagnosis	Lung challenge tests, spirometry, blood tests showing high levels of eosinophils, and physical exam	A physical exam and elimination of other conditions
Age when diagnosis can be made	After age 5	Before or after age 5
Treatment	Inhalers with bronchodilators, as well as medicine such as corticosteroids	Rescue inhalers and avoiding irritants

DB Difference Between.net

"Reactive Airways Disease"

A Lazy Term of Uncertain Meaning That Should Be Abandoned

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The terms "reactive airways" and "reactive airways disease" have crept into the clinical lexicon in recent years. They are being used as synonyms for asthma. The terms are widely used in case presentations involving outpatients and inpatients, and even patients in intensive care units. They are in particular commonly used in the pediatric setting. The problem is that "reactive airways" and "reactive airways disease" are highly nonspecific terms that have no clinical meaning. As such, we view these terms as unhelpful and potentially harmful, and we recommend that they not be used.

disorder is currently recognized as distinct by the American Thoracic Society and the American College of Chest Physicians (3).

Airway hyperreactivity is also a specific term that means that the airways are hyperreactive to a variety of stimuli including methacholine, histamine, hypertonic saline, distilled water, exercise, or eucapnic hyperventilation (4). Hyperreactivity in this context means a bronchoconstrictor response at "doses" that normally have no bronchoconstrictor effect. Airway hyerreactivity actually encompasses both airway sensitiv-