Asthma & Chronic Obstructive Pulmonary Disease (COPD)

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Definitions

- **Asthma** is a heterogeneous disease, usually characterized by chronic airway inflammation. 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. [GINA 2016]

- **COPD** (Chronic Obstructive Pulmonary Disease) is a common preventable and treatable disease, characterized by persistent airflow limitation that is usually progressive and associated with enhanced chronic inflammatory responses in the airways and the lungs to noxious particles or gases. Exacerbations and comorbidities contribute to the overall severity in individual patients. [GOLD 2016]

- **ACOS** (Asthma-COPD overlap syndrome) is characterized by persistent airflow limitation with several features usually associated with asthma and several features usually associated with COPD. ACOS is therefore identified by the features that it shares with both asthma and COPD.
  A specific definition for ACOS cannot be developed until more evidence is available about its clinical phenotypes and underlying mechanisms.

Introduction to Asthma

- Asthma is one of the most common chronic diseases worldwide with an estimated 300 million affected individuals
- Prevalence is increasing in many countries, especially in children
- Asthma is a major cause of school and work absence

Global INitiative for Asthma

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Asthma

Definition of Asthma

- Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation.

- 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.

Source: GINA 2016

Burden of Asthma

Health care expenditure on asthma is very high

- Developed economies might expect to spend 1-2 percent of total health care expenditures on asthma.
- Developing economies likely to face increased demand due to increasing prevalence of asthma
- Poorly controlled asthma is expensive
- However, investment in prevention medication is likely to yield cost savings in emergency care

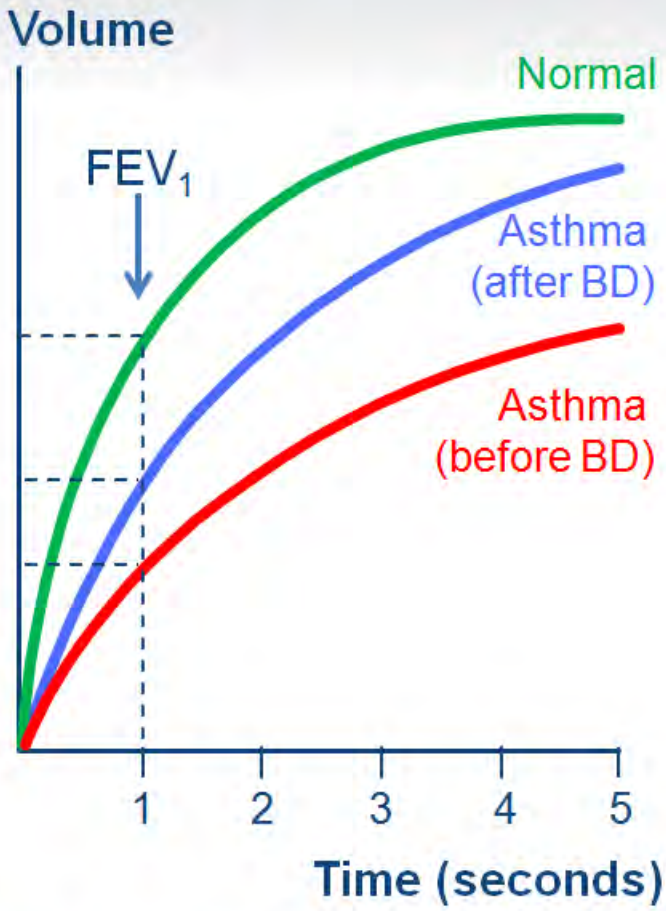
Source: GINA 2016

Diagnosis of Asthma

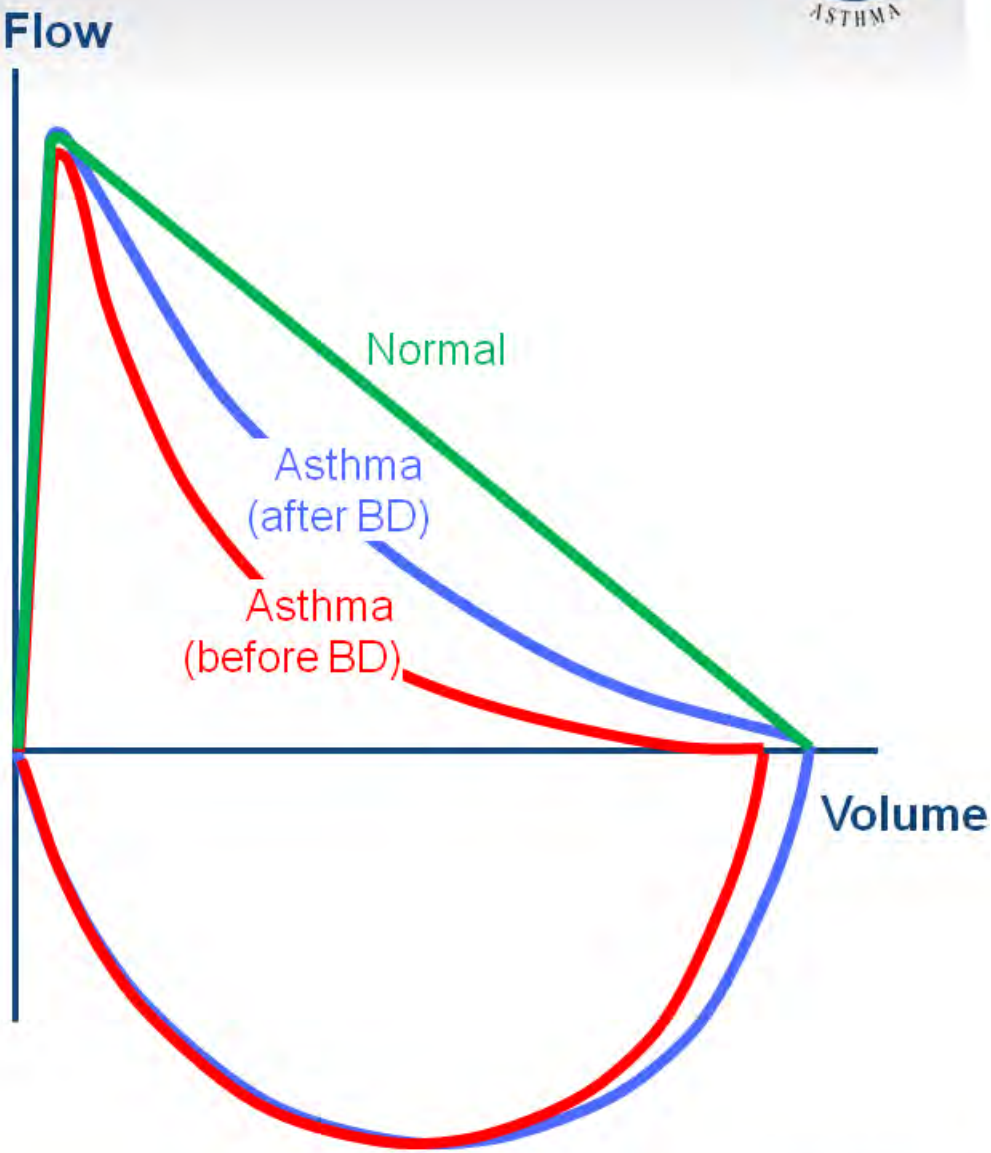
- The diagnosis of asthma should be based on:
  - A history of characteristic symptom patterns
  - Evidence of variable airflow limitation, from bronchodilator reversibility testing or other tests
- Document evidence for the diagnosis in the patient's notes, preferably before starting controller treatment
  - It is often more difficult to confirm the diagnosis after treatment has been started
- Asthma is usually characterized by airway inflammation and airway hyperresponsiveness, but these are not necessary or sufficient to make the diagnosis of asthma.

Source: GINA 2016

Typical spirometric tracings



Note: Each FEV_1 represents the highest of three reproducible measurements



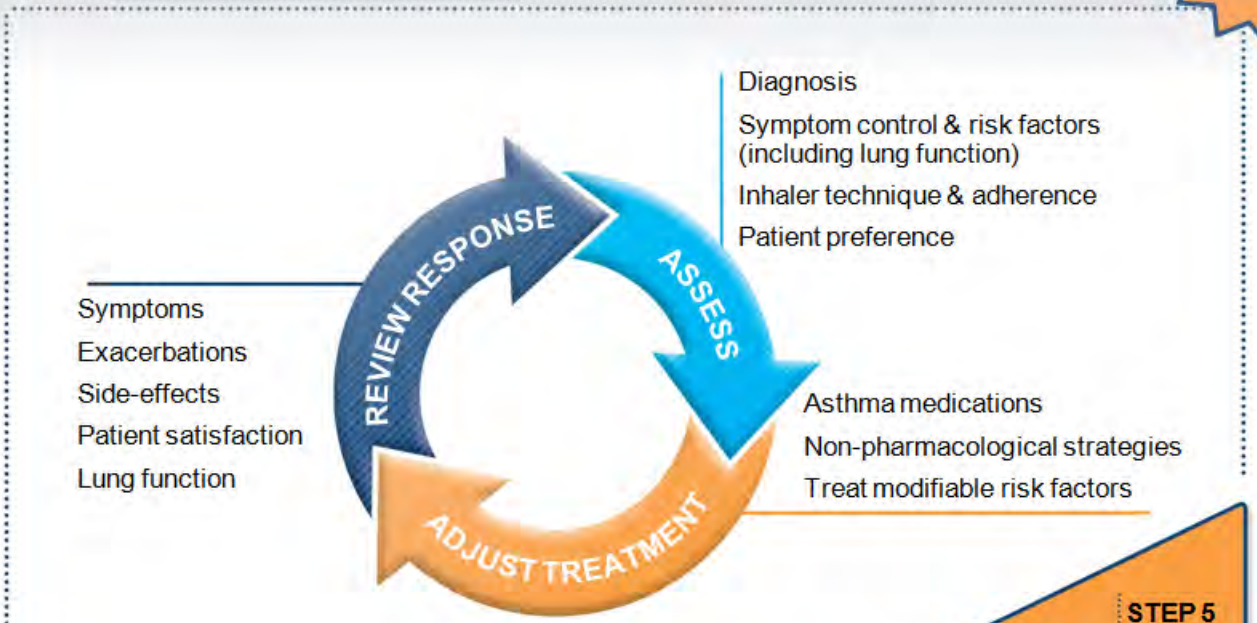
Assessment of Asthma

- Asthma control - two domains
  - Assess symptom control over the last 4 weeks
  - Assess risk factors for poor outcomes, including low lung function
- Treatment issues
  - Check inhaler technique and adherence
  - Ask about side-effects
  - Does the patient have a written asthma action plan?
  - What are the patient's attitudes and goals for their asthma?
- Comorbidities
  - Think of rhinosinusitis, GERD, obesity, obstructive sleep apnea, depression, anxiety
  - These may contribute to symptoms and poor quality of life

Source: GINA 2016

Stepwise management - pharmacotherapy

UPDATED!



	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER CHOICE		Low dose ICS	Low dose ICS/LABA**	Med/high ICS/LABA	Refer for add-on treatment e.g. tiotropium,*† omalizumab, mepolizumab†
Other controller options	*Consider low dose ICS*	*Leukotriene receptor antagonists (LTRA) Low dose theophylline**	*Med/high dose ICS Low dose ICS+LTRA (or + theoph*)*	*Add tiotropium† High dose ICS + LTRA (or + theoph*)*	*Add low dose OCS*
RELIEVER	As-needed short-acting beta2-agonist (SABA)		As-needed SABA or low dose ICS/formoterol#		

*Not for children <12 years

**For children 6-11 years, the preferred Step 3 treatment is medium dose ICS

#For patients prescribed BDP/formoterol or BUD/formoterol maintenance and reliever therapy

† Tiotropium by mist inhaler is an add-on treatment for patients ≥12 years with a history of exacerbations

Stepwise management – additional components

REMEMBER TO...

- Provide guided self-management education
- Treat modifiable risk factors and comorbidities
- Advise about non-pharmacological therapies and strategies
- Consider stepping up if … uncontrolled symptoms, exacerbations or risks, but check diagnosis, inhaler technique and adherence first
- Consider stepping down if … symptoms controlled for 3 months + low risk for exacerbations. Ceasing ICS is not advised.

GINA assessment of symptom control

A. Symptom control		Level of asthma symptom control		
In the past 4 weeks, has the patient had:		**Well-controlled**	**Partly controlled**	**Uncontrolled**
• Daytime asthma symptoms more than twice a week?	Yes ❑ No ❑	None of these	1-2 of these	3-4 of these
• Any night waking due to asthma?	Yes ❑ No ❑			
• Reliever needed for symptoms* more than twice a week?	Yes ❑ No ❑			
• Any activity limitation due to asthma?	Yes ❑ No ❑			

*Excludes reliever taken before exercise, because many people take this routinely

This classification is the same as the GINA 2010-12 assessment of 'current control', except that lung function now appears only in the assessment of risk factors

GINA assessment of symptom control

A. Symptom control

In the past 4 weeks, has the patient had:

- Daytime asthma symptoms more than twice a week? Yes❑ No❑
- Any night waking due to asthma? Yes❑ No❑
- Reliever needed for symptoms* more than twice a week? Yes❑ No❑
- Any activity limitation due to asthma? Yes❑ No❑

Level of asthma symptom control

Well-controlled	Partly controlled	Uncontrolled
None of these	1-2 of these	3-4 of these

B. Risk factors for poor asthma outcomes

- Assess risk factors at diagnosis and periodically
- Measure FEV_1 at start of treatment, after 3 to 6 months of treatment to record the patient's personal best, then periodically for ongoing risk assessment

ASSESS PATIENT'S RISKS FOR:

- Exacerbations
- Fixed airflow limitation
- Medication side-effects

Assessment of risk factors for poor asthma outcomes

Risk factors for exacerbations include:

- Ever intubated for asthma
- Uncontrolled asthma symptoms
- Having ≥1 exacerbation in last 12 months
- Low FEV_1 (measure lung function at start of treatment, at 3-6 months to assess personal best, and periodically thereafter)
- Incorrect inhaler technique and/or poor adherence
- Smoking
- Obesity, pregnancy, blood eosinophilia

Risk factors for fixed airflow limitation include:

- No ICS treatment, smoking, occupational exposure, mucus hypersecretion, blood eosinophilia

Risk factors for medication side-effects include:

- Frequent oral steroids, high dose/potent ICS, P450 inhibitors

Goals of Asthma Management

- The long-term goals of asthma management are
  - Symptom control: to achieve good control of symptoms and maintain normal activity levels
  - Risk reduction: to minimize future risk of exacerbations, fixed airflow limitation and medication side-effects
- Achieving these goals requires a partnership between patient and their health care providers
  - Ask the patient about their own goals regarding their asthma
  - Good communication strategies are essential
  - Consider the health care system, medication availability, cultural and personal preferences and health literacy

Source: GINA 2016

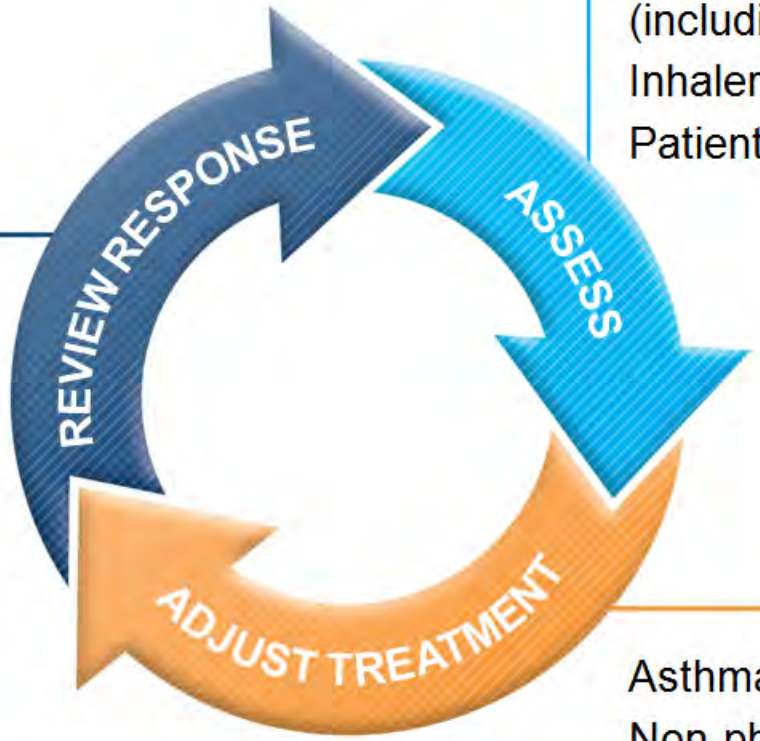
Key Strategies to Facilitate Good Communication

- Improve communication skills
  - Friendly manner
  - Allow the patient to express their goals, beliefs and concerns
  - Empathy and reassurance
  - Encouragement and praise
  - Provide appropriate (personalized) information
  - Feedback and review
- Benefits include:
  - Increased patient satisfaction
  - Better health outcomes
  - Reduced use of health care resources

Source: GINA 2016

The control-based asthma management cycle

Diagnosis
Symptom control & risk factors (including lung function)
Inhaler technique & adherence
Patient preference



Symptoms
Exacerbations
Side-effects
Patient satisfaction
Lung function

Asthma medications
Non-pharmacological strategies
Treat modifiable risk factors

Choosing Between Controller Options – Individual Patient Decisions

- Preferred treatment for symptom control and for risk reduction
- Patient characteristics (phenotype)
  - Does the patient have any known predictors of risk or response? (e.g. smoker, history of exacerbations, blood eosinophilia)
- Patient preference
  - What are the patient's goals and concerns for their asthma?
- Practical issues
  - Inhaler technique - can the patient use the device correctly after training?
  - Adherence: how often is the patient likely to take the medication?
  - Cost: can the patient afford the medication?

Source: GINA 2016

Reviewing Response and Adjusting Treatment

- How often should asthma be reviewed?
  - 1-3 months after treatment started, then every 3-12 months
  - During pregnancy, every 4-6 weeks
  - After an exacerbation, within 1 week
- Stepping up asthma treatment
  - Sustained step-up, for at least 2-3 months if asthma poorly controlled
    - Important: first check for common causes (symptoms not due to asthma, incorrect inhaler technique, poor adherence)
  - Short-term step-up, for 1-2 weeks, e.g. with viral infection or allergen
    - May be initiated by patient with written asthma action plan
  - Day-to-day adjustment
    - For patients prescribed low-dose ICS/formoterol maintenance and reliever regimen*
- Stepping down asthma treatment
  - Consider step-down after good control maintained for 3 months
  - Find each patient's minimum effective dose, that controls both symptoms and exacerbations

*Approved only for low dose beclometasone/formoterol and low dose budesonide/formoterol

Source: GINA 2016

General Principles for Stepping Down Controller Treatment

- Aim: To find the lowest dose that controls symptoms and exacerbations, and minimizes the risk of side-effects
- When to consider stepping down
  - When symptoms have been well controlled and lung function stable for ≥3 months
  - No respiratory infection, patient not travelling, not pregnant
- Prepare for step-down
  - Record the level of symptom control and consider risk factors
  - Make sure the patient has a written asthma action plan
  - Book a follow-up visit in 1-3 months
- Step down through available formulations
  - Stepping down ICS doses by 25–50% at 3 month intervals is feasible and safe for most patients (Hagan et al, Allergy 2014)
  - See GINA 2016 report Box 3-7 for specific step-down options
- Stopping ICS is not recommended in adults with asthma because of risk of exacerbations (Rank et al, JACI 2013)

Source: GINA 2016

Treating Modifiable Risk Factors

- Provide skills and support for guided asthma self-management
  - This comprises self-monitoring of symptoms and/or PEF, a written asthma action plan and regular medical review
- Prescribe medications or regimen that minimize exacerbations
  - ICS-containing controller medications reduce risk of exacerbations
  - For patients with ≥1 exacerbations in previous year, consider low-dose ICS/formoterol maintenance and reliever regimen*
- Encourage avoidance of tobacco smoke (active or ETS)
  - Provide smoking cessation advice and resources at every visit
- For patients with severe asthma
  - Refer to a specialist center, if available, for consideration of add-on medications and/or sputum-guided treatment
- For patients with confirmed food allergy:
  - Appropriate food avoidance
  - Ensure availability of injectable epinephrine for anaphylaxis

*Approved only for low dose beclometasone/formoterol and low dose budesonide/formoterol

Source: GINA 2016

Non-Pharmacological Interventions

- Avoidance of tobacco smoke exposure
  - Provide advice and resources at every visit; advise against exposure of children to environmental tobacco smoke (house, car)
- Physical activity
  - Encouraged because of its general health benefits. Provide advice about exercise-induced bronchoconstriction
- Occupational asthma
  - Ask patients with adult-onset asthma about work history. Remove sensitizers as soon as possible. Refer for expert advice, if available
- Avoid medications that may worsen asthma
  - Always ask about asthma before prescribing NSAIDs or beta-blockers
- Remediation of dampness or molds in homes
  - Reduces asthma symptoms and medication use in adults
- (Allergen avoidance)
  - (Not recommended as a general strategy for asthma)

This slide shows examples of interventions with high quality evidence

Source: GINA 2016

Assessing Asthma Severity

- How?
  - Asthma severity is assessed retrospectively from the level of treatment required to control symptoms and exacerbations
- When?
  - Assess asthma severity after patient has been on controller treatment for several months
  - Severity is not static – it may change over months or years, or as different treatments become available
- Categories of asthma severity
  - Mild asthma: well-controlled with Steps 1 or 2 (as-needed SABA or low dose ICS)
  - Moderate asthma: well-controlled with Step 3 (low-dose ICS/LABA)
  - Severe asthma: requires Step 4/5 (moderate or high dose ICS/LABA ± add-on), or remains uncontrolled despite this treatment

Source: GINA 2016

Indications For Considering Referral - 1

- Difficulty confirming the diagnosis of asthma
  - Symptoms suggesting chronic infection, cardiac disease etc
  - Diagnosis unclear even after a trial of treatment
  - Features of both asthma and COPD, if in doubt about treatment
- Suspected occupational asthma
  - Refer for confirmatory testing, identification of sensitizing agent, advice about eliminating exposure, pharmacological treatment
- Persistent uncontrolled asthma or frequent exacerbations
  - Uncontrolled symptoms or ongoing exacerbations or low FEV1 despite correct inhaler technique and good adherence with Step 4
  - Frequent asthma-related health care visits
- Risk factors for asthma-related death
  - Near-fatal exacerbation in past
  - Anaphylaxis or confirmed food allergy with asthma

Source: GINA 2016

Indications For Considering Referral - 2

- Significant side-effects (or risk of side-effects)
  - Significant systemic side-effects
  - Need for oral corticosteroids long-term or as frequent courses
- Symptoms suggesting complications or sub-types of asthma
  - Nasal polyposis and reactions to NSAIDS (may be aspirin exacerbated respiratory disease)
  - Chronic sputum production, fleeting shadows on CXR (may be allergic bronchopulmonary aspergillosis)
- Additional reasons for referral in children 6-11 years
  - Doubts about diagnosis, e.g. symptoms since birth
  - Symptoms or exacerbations remain uncontrolled
  - Suspected side-effects of treatment, e.g. growth delay
  - Asthma with confirmed food allergy

Source: GINA 2016

Guided Asthma Self-Management and Skills Training

- Essential components are:
- Skills training to use inhaler devices correctly
- Encouraging adherence with medications, appointments
- Asthma information
- Guided self-management support
  - Self-monitoring of symptoms and/or PEF
  - Written asthma action plan
  - Regular review by a health care provider

Source: GINA 2016

Provide Hands-On Inhaler Skills Training

- Choose
  - Choose an appropriate device before prescribing. Consider medication options, arthritis, patient skills and cost. For ICS by pMDI, prescribe a spacer
  - Avoid multiple different inhaler types if possible
- Check
  - Check technique at every opportunity – "Can you show me how you use your inhaler at present?"
  - Identify errors with a device-specific checklist
- Correct
  - Give a physical demonstration to show how to use the inhaler correctly
  - Check again (up to 2-3 times)
  - Re-check inhaler technique frequently, as errors often recur within 4-6 weeks
- Confirm
  - Can you demonstrate correct technique for the inhalers you prescribe?
  - Brief inhaler technique training improves asthma control

Source: GINA 2016

Check Adherence With Asthma Medications

- Poor adherence:
  - Is very common: it is estimated that 50% of adults and children do not take controller medications as prescribed
  - Contributes to uncontrolled asthma symptoms and risk of exacerbations and asthma-related death
- Contributory factors
  - Unintentional (e.g. forgetfulness, cost, confusion) and/or
  - Intentional (e.g. no perceived need, fear of side-effects, cultural issues, cost)
- How to identify patients with low adherence:
  - Ask an empathic question, e.g. “Do you find it easier to remember your medication in the morning or the evening?”, or “Would you say you are taking it 3 days a week, or less, or more?”
  - Check prescription date, label date and dose counter
  - Ask patient about their beliefs and concerns about the medication

Source: GINA 2016

Strategies to Improve Adherence in Asthma

Only a few interventions have been studied closely in asthma and found to be effective for improving adherence

- Shared decision-making
- Simplifying the medication regimen (once vs. twice-daily)
- Comprehensive asthma education with nurse home visits
- Inhaler reminders for missed doses
- Reviewing patients' detailed dispensing records

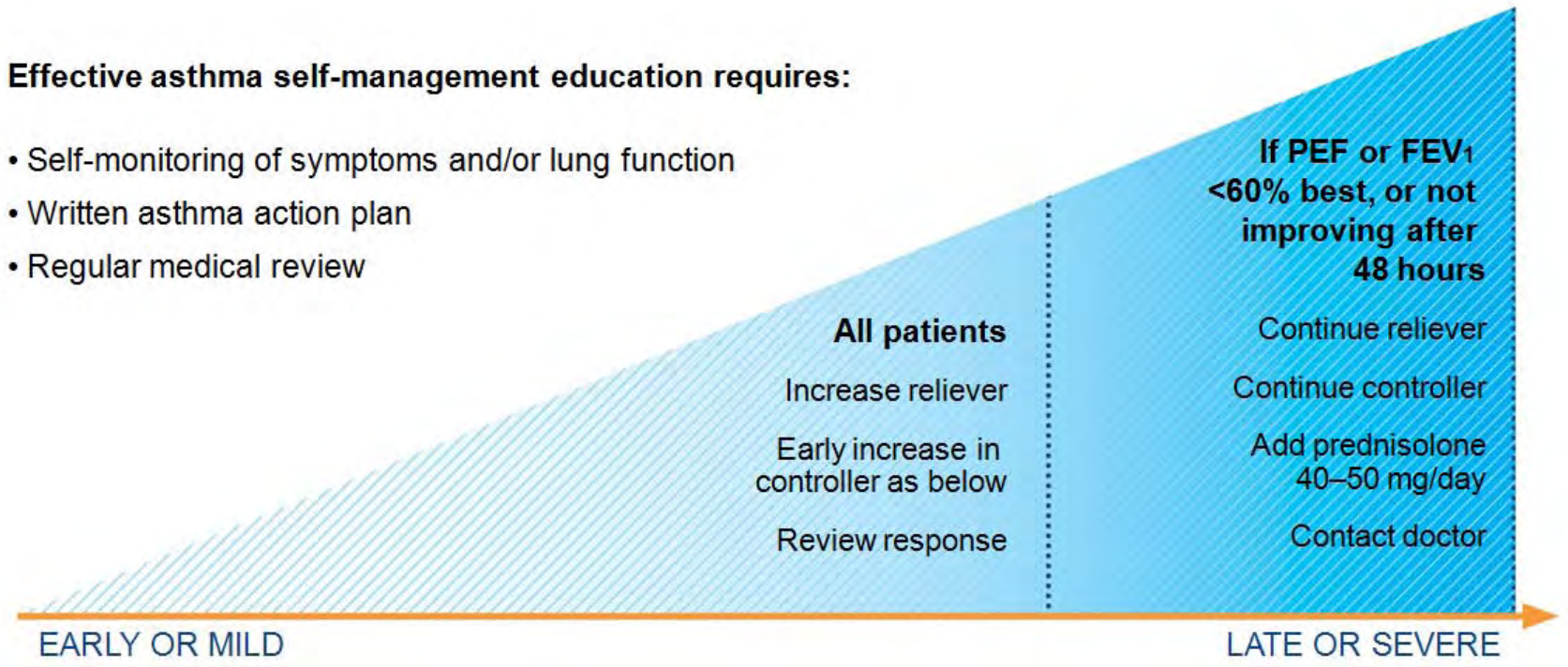
Source: GINA 2016

Written Asthma Action Plans

- All patients should have a written asthma action plan
  - The aim is to show the patient how to recognize and respond to worsening asthma
  - It should be individualized for the patient's medications, level of asthma control and health literacy
  - Based on symptoms and/or PEF (children: only symptoms)
- The action plan should include:
  - The patient's usual asthma medications
  - When/how to increase reliever and controller or start OCS
  - How to access medical care if symptoms fail to respond
- Why?
  - When combined with self-monitoring and regular medical review, action plans are highly effective in reducing asthma mortality and morbidity

Source: GINA 2016

Written Asthma Action Plans



Source: GINA 2016

Clinical Case - Asthma

- QC is a 5-year-old girl, brought by her parents to the emergency for complaints of dyspnea and coughing that have progressively worsened over the past 2 days.

- These symptoms were preceded by 3 days of upper respiratory tract infection with no fever. On physical exam, she has a moderate respiratory distress, with audible expiratory wheezes.

- The doctor diagnoses asthma, and orders for albuterol nebulization during hospitalization; her response was adequate.

Clinical Case - Asthma

Q1: Upon discharge, the doctor prescribes for QC an as needed inhaled beta agonist, plus a low-dose corticosteroid (fluticasone), with a spacer.

a. You think he is right since asthma is an inflammatory disease; this is a step2 treatment

b. You think this is unnecessary since it is only the first asthmatic episode for QC; she needs a step1 treatment

c. You think he is wrong because steroids should not be given for asthmatic children due to their side effects

d. None of the above

Clinical Case - Asthma

Q2: Three months later, QC comes back for a check up, and her mother reveals that she has been wheezing almost every night since she left the hospital. What do you consider for her treatment?

a. A medium dose inhaled corticosteroid
b. A long acting bronchodilator such as theophyllin or LABA
c. A medium dose oral corticosteroid
d. a and b

Clinical Case - Asthma

Q3: Two months later, QC comes back with uncontrolled asthma. The doctor decides to move to step 4.

a. Medium to high ICS + LABA
b. Oral CS + LABA
c. Omalizumab
d. None of the above

Clinical Case - Asthma

Q4: Finally, QC is controlled on this treatment. You consider that she has:

a. Mild asthma
b. Moderate asthma
c. Severe asthma
d. None of the above

Chronic Obstructive Pulmonary Disease (COPD)

Global Initiative for Obstructive Lung Disease

Global **I**nitiative for **C**hronic

Obstructive

Lung

Disease

Definition of COPD

- COPD, a common preventable and treatable disease, is characterized by persistent airflow limitation that is usually progressive
- Associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases.
- Exacerbations and comorbidities contribute to the overall severity in individual patients.

Source: GOLD 2015

Burden of COPD

- COPD is a leading cause of morbidity and mortality worldwide.
- The burden of COPD is projected to increase in coming decades due to continued exposure to COPD risk factors and the aging of the world's population.
- COPD is associated with significant economic burden.

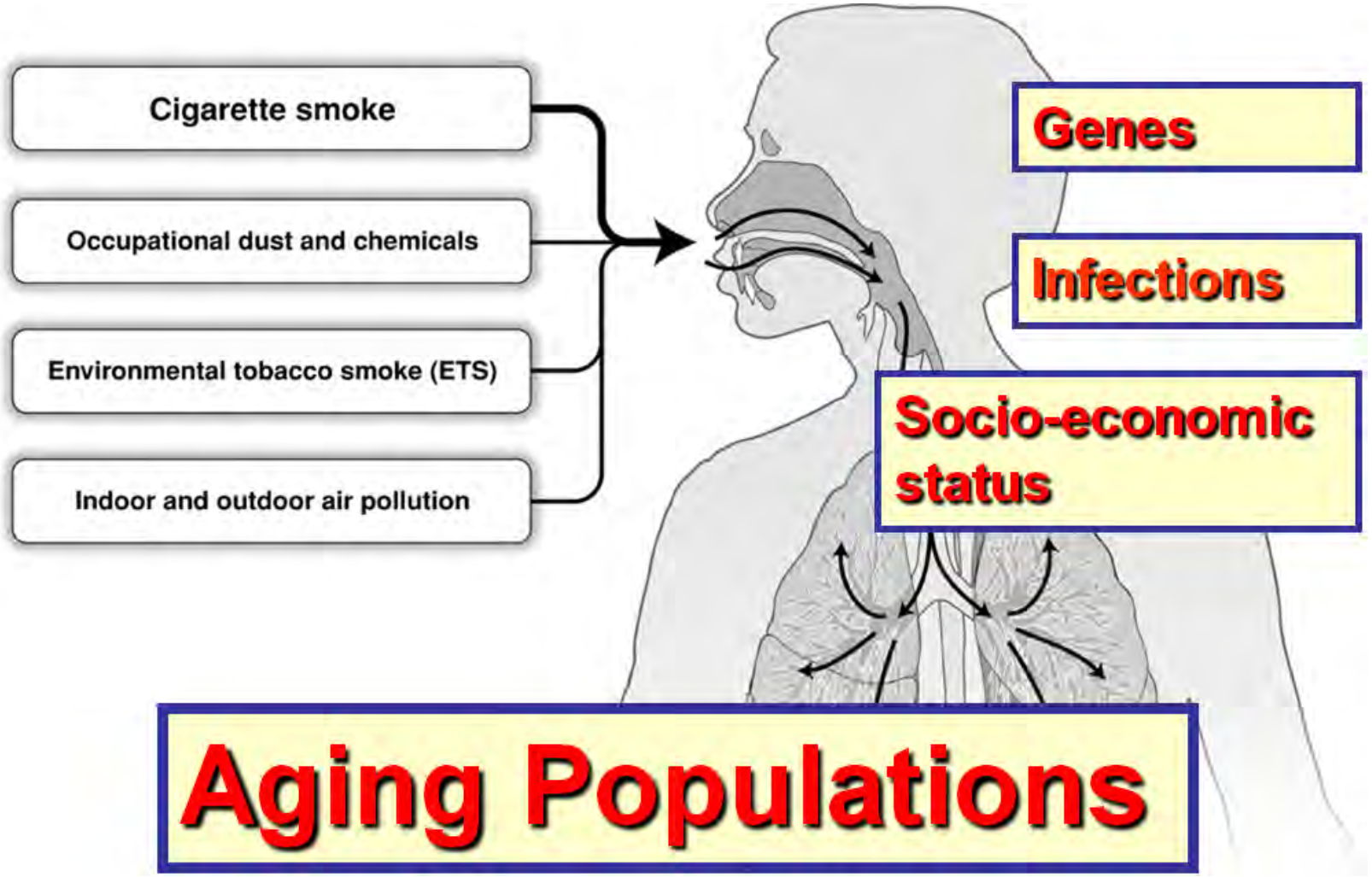
Source: GOLD 2015

Risk Factors for COPD

- Genes
- Exposure to particles
  - Tobacco smoke
  - Occupational dusts, organic and inorganic
  - Indoor air pollution from heating and cooking with biomass in poorly ventilated dwellings
  - Outdoor air pollution
- Lung growth and development
- Gender
- Age
- Respiratory infections
- Socioeconomic status
- Asthma/Bronchial hyperreactivity
- Chronic Bronchitis

Source: GOLD 2015

Risk Factors for COPD



Source: GOLD 2015

Diagnosis and Assessment: Key Points

- A clinical diagnosis of COPD should be considered in any patient who has dyspnea, chronic cough or sputum production, and a history of exposure to risk factors for the disease.
- Spirometry is ***required*** to make the diagnosis; the presence of a post-bronchodilator FEV1/FVC < 0.70 confirms the presence of persistent airflow limitation and thus of COPD.

Source: GOLD 2015

Symptoms of COPD

- The characteristic symptoms of COPD are chronic and progressive dyspnea, cough, and sputum production that can be variable from day-to-day.
- Dyspnea: Progressive, persistent and characteristically worse with exercise.
- Chronic cough: May be intermittent and may be unproductive.
- Chronic sputum production: COPD patients commonly cough up sputum.

Source: GOLD 2015

Assessment of COPD

- Assess symptoms
- Assess degree of airflow limitation using spirometry
- Assess risk of exacerbations
- Assess comorbidities

Source: GOLD 2015

Assessment of COPD

Assess Symptoms

PLEASE TICK IN THE BOX THAT APPLIES TO YOU
(ONE BOX ONLY)

mMRC Grade 0. I only get breathless with strenuous exercise. ☐

mMRC Grade 1. I get short of breath when hurrying on the level or walking up a slight hill. ☐

mMRC Grade 2. I walk slower than people of the same age on the level because of breathlessness, or I have to stop for breath when walking on my own pace on the level. ☐

mMRC Grade 3. I stop for breath after walking about 100 meters or after a few minutes on the level. ☐

mMRC Grade 4. I am too breathless to leave the house or I am breathless when dressing or undressing. ☐

Source: GOLD 2015

Assessment of COPD

Assess Degree of Airflow Limitation

- Use spirometry for grading severity, using four grades split at 80%, 50% and 30% of predicted value in patients with FEV1/FVC < 0.70.
- Classification of Severity of Airflow Limitation in COPD*
  - **GOLD 1: Mild** FEV1 > 80% predicted
  - **GOLD 2: Moderate** 50% < FEV1 < 80% predicted
  - **GOLD 3: Severe** 30% < FEV1 < 50% predicted
  - **GOLD 4: Very Severe** FEV1 < 30% predicted

*Based on Post-Bronchodilator FEV1

Source: GOLD 2015

Assessment of COPD

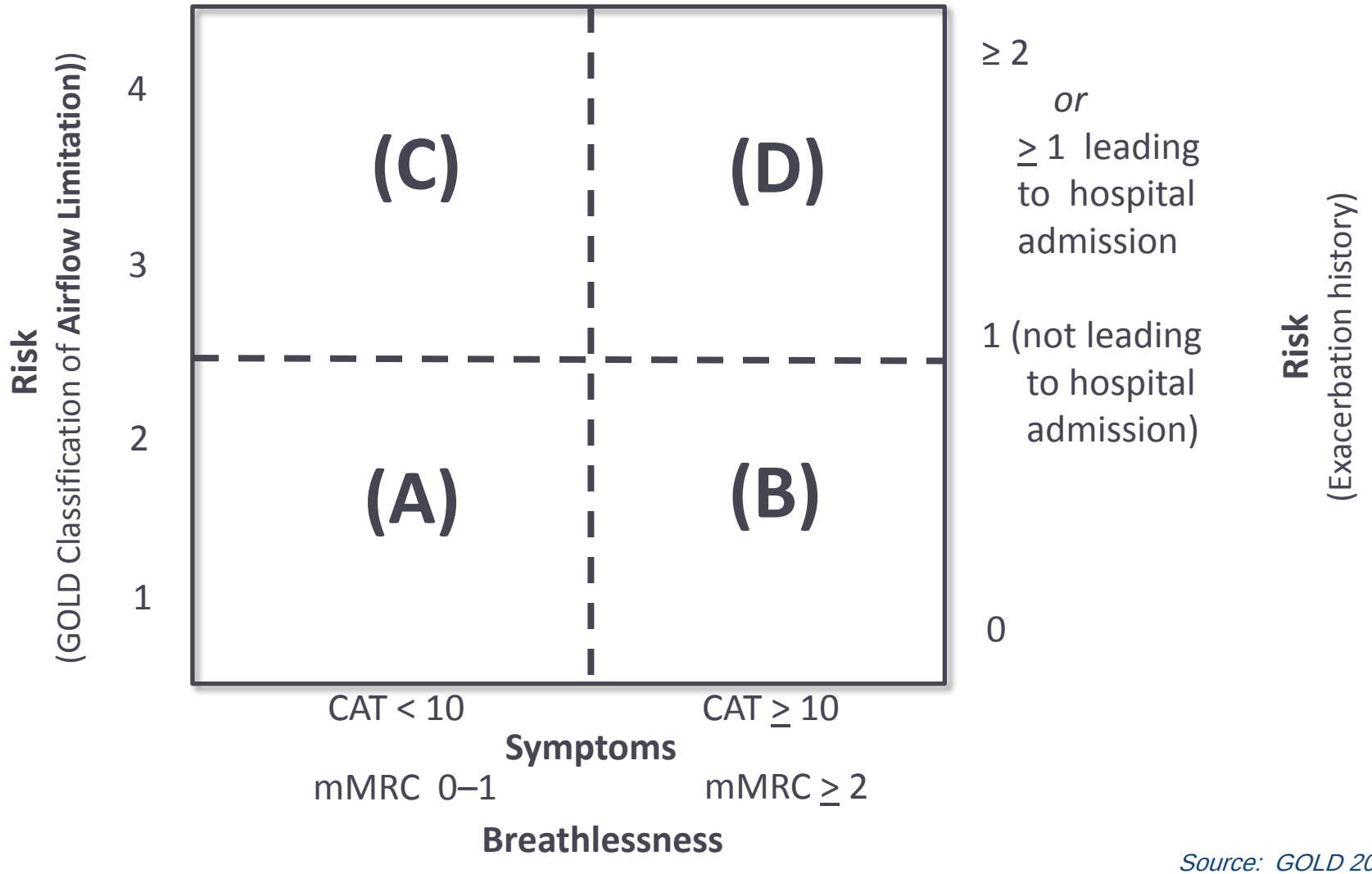
Assess of Risk Exacerbation

- Use history of exacerbations and spirometry.
- Two or more exacerbations within the last year or an FEV1 < 50 % of predicted value are indicators of high risk.
- One or more hospitalizations for COPD exacerbation should be considered high risk.

*Based on Post-Bronchodilator FEV1

Source: GOLD 2015

Combined Assessment of COPD



Source: GOLD 2015

Combined Assessment of COPD

Patient	Characteristic	Spirometric Classification	Exacerbations per year	CAT	mMRC
A	Low Risk Less Symptoms	GOLD 1-2	≤ 1	< 10	0-1
B	Low Risk More Symptoms	GOLD 1-2	≤ 1	≥ 10	≥ 2
C	High Risk Less Symptoms	GOLD 3-4	≥ 2	< 10	0-1
D	High Risk More Symptoms	GOLD 3-4	≥ 2	≥ 10	≥ 2

Source: GOLD 2015

Assessment of COPD

Assess COPD Comorbidities

COPD patients are at increased risk for:

- Cardiovascular diseases
- Osteoporosis
- Respiratory infections
- Anxiety and Depression
- Diabetes
- Lung cancer
- Bronchiectasis

These comorbid conditions may influence mortality and hospitalizations and should be looked for routinely, and treated appropriately.

Source: GOLD 2015

Therapeutic Options: Key Points

- Smoking cessation has the greatest capacity to influence the natural history of COPD. Health care providers should encourage all patients who smoke to quit.
- Pharmacotherapy and nicotine replacement reliably increase long-term smoking abstinence rates.
- All COPD patients benefit from regular physical activity and should repeatedly be encouraged to remain active.
- Appropriate pharmacologic therapy can reduce COPD symptoms, reduce the frequency and severity of exacerbations, and improve health status and exercise tolerance.
- None of the existing medications for COPD has been shown conclusively to modify the long-term decline in lung function.
- Influenza and pneumococcal vaccination should be offered depending on local guidelines.

Source: GOLD 2015

Brief Strategies to Help the Patient Willing to Quit Smoking

- ASK — Systematically identify all tobacco users at every visit
- ADVISE — Strongly urge all tobacco users to quit
- ASSESS — Determine willingness to make a quit attempt
- ASSIST — Aid the patient in quitting
- ARRANGE — Schedule follow-up contact.

Source: GOLD 2015

Manage Stable COPD:

Non-Pharmacologic

Patient Group	Essential	Recommended	Depending on local guidelines
A	Smoking cessation (can include pharmacologic treatment)	Physical activity	Flu vaccination Pneumococcal vaccination
B, C, D	Smoking cessation (can include pharmacologic treatment) Pulmonary rehabilitation	Physical activity	Flu vaccination Pneumococcal vaccination

Source: GOLD 2015

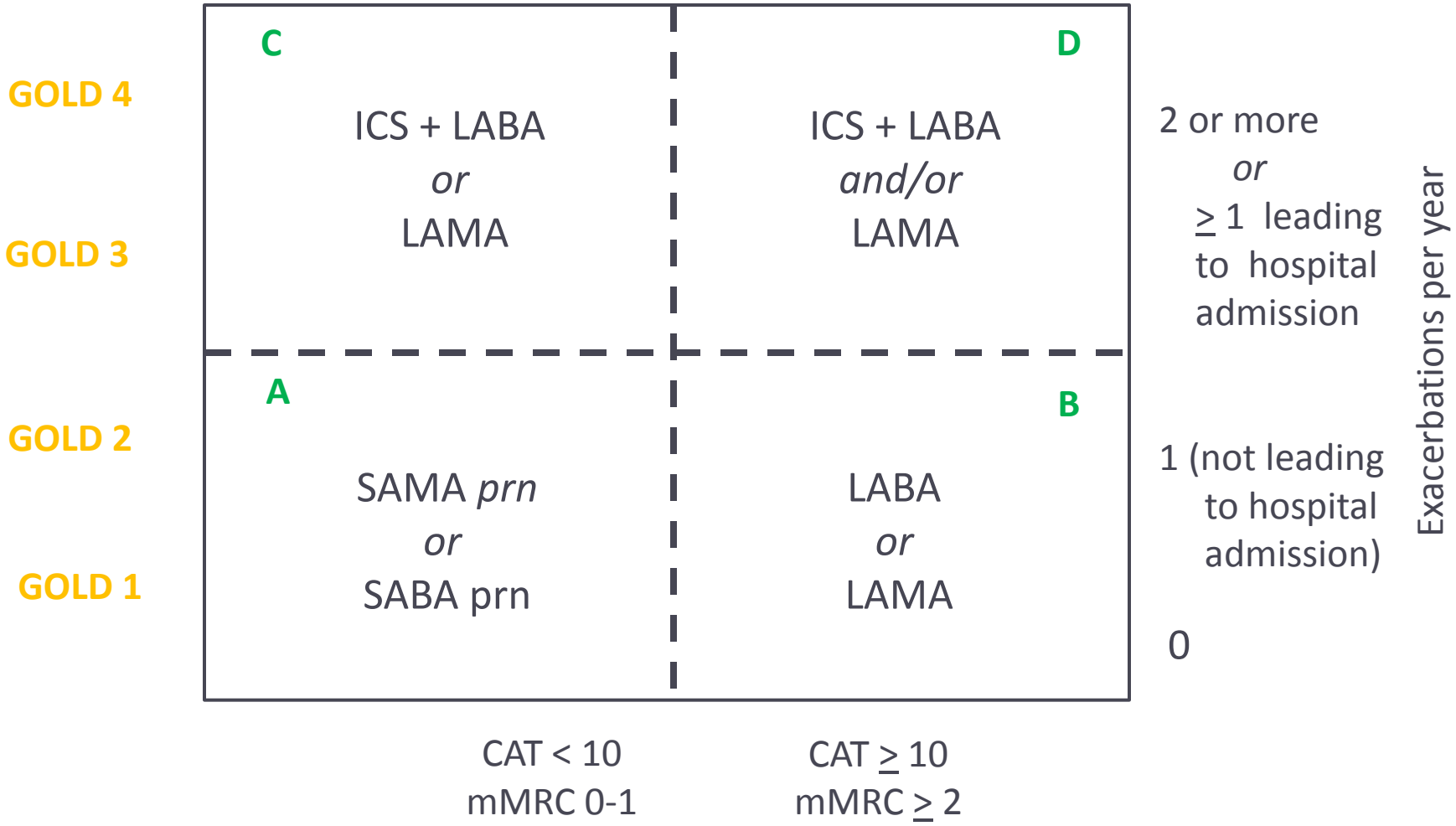
Therapeutic Options: COPD Medications

Beta$_2$-agonists
Short-acting beta$_2$-agonists (SABA)
Long-acting beta$_2$-agonists (LABA)
Anticholinergics
Short-acting anticholinergics (SAMA)
Long-acting anticholinergics (LAMA)
Combination short-acting beta$_2$-agonists + anticholinergic in one inhaler Combination long-acting beta$_2$-agonist + anticholinergic in one inhaler
Methylxanthines
Inhaled corticosteroids (ICS)
Combination long-acting beta$_2$-agonists + corticosteroids in one inhaler
Systemic corticosteroids
Phosphodiesterase-4 inhibitors (Roflumilast)

Source: GOLD 2015

Manage Stable COPD:

Pharmacologic Therapy - Recommended 1st Choice



Source: GOLD 2015

Manage Stable COPD:

Pharmacologic Therapy

Patient	Recommended First Choice	Alternative Choice		Other Possible Treatments
A	SAMA prn or SABA prn	LAMA or LABA or SABA and SAMA		Theophylline
B	LAMA or LABA	LAMA and LABA		SABA and/or SAMA Theophylline
C	ICS + LABA or LAMA	LAMA and LABA or LAMA and PDE4-inh. or LABA and PDE4-inh.		SABA and/or SAMA Theophylline
D	ICS + LABA and/or LAMA	ICS + LABA and LAMA or ICS+LABA and PDE4-inh. or LAMA and LABA or LAMA and PDE4-inh.		Carbocysteine N-acetylcysteine SABA and/or SAMA Theophylline

Source: GOLD 2015

Manage Exacerbations

An exacerbation of COPD is:

"an acute event characterized by a worsening of the patient's respiratory symptoms that is beyond normal day-to-day variations and leads to a change in medication."

Source: GOLD 2015

Manage Exacerbations:

Key Points

- Short-acting inhaled beta2-agonists with or without short-acting anticholinergics are usually the preferred bronchodilators for treatment of an exacerbation.

- Systemic corticosteroids and antibiotics can shorten recovery time, improve lung function (FEV1) and arterial hypoxemia (PaO2), and reduce the risk of early relapse, treatment failure, and length of hospital stay.

- COPD exacerbations can often be prevented.

Source: GOLD 2015

Manage Exacerbations:

Indications for Hospital Admission

- Marked increase in intensity of symptoms
- Severe underlying COPD
- Onset of new physical signs
- Failure of an exacerbation to respond to initial medical management
- Presence of serious comorbidities
- Frequent exacerbations
- Older age
- Insufficient home support

Source: GOLD 2015

Clinical Case - COPD

- JH is a 65y male, heavy smoker, with a cumulative smoking history of 80 pack-years. Every day, he wakes up with a severe cough, followed by heavy expectorations and severe dyspnea, but he refuses to stop smoking and to seek doctor's help.

- One day, he wakes up with a very severe cough and cyanosis, followed by yellow sputum expectoration and a fever of 39 degrees. He accepts to see a doctor, who hospitalizes him and orders for several tests; abnormal results on admission were:
  - WBC= 15000 (N=4500-11000 cells/mm3)
  - Glu=450 (N=60-110mg/dL)
  - HbA1C=8% (N< 7%)
  - Creat=2 (N=0.2-0.8mg/dL)
  - BP=175/100mmHg
  - ABGs show hypoxia, hypercapnea, and metabolic acidosis
  - Spirometric test shows moderate obstruction
  - Chest X-ray show bilateral infiltrates

Clinical Case - COPD

Q1: The diagnosis was chronic bronchitis, exacerbated by a bacterial infection. Treatment is installed. For emergency treatment of the chronic bronchitis, you suggest:

a. Albuterol nebulization every 4hrs
b. Oxygen therapy
c. Ipratropium bromide nebulization
d. a and b
e. All of the above

Clinical Case - COPD

Q2: Upon discharge, the patient is assessed for COPD. He has COPD class:

a. A
b. B
c. C
d. D

Clinical Case - COPD

Q3: For maintenance therapy, you suggest:

a. Albuterol aerosol regularly
b. Tiotropium + Budesonide
c. Oral corticosteroids
d. None of the above

Clinical Case - COPD

Q4: The patient does not stop smoking, as requested by the doctor. He is at risk of:

a. A new exacerbation
b. Cardiovascular comorbidity
c. More severe COPD
d. All of the above

Thank You

Questions?

Additional Slides

Low, Medium and High Dose Inhaled Corticosteroids Adults and Adolescents (≥12 years)

UPDATED!

Inhaled corticosteroid	Total daily dose (mcg)		
	Low	Medium	High
Beclometasone dipropionate (CFC)	200–500	>500–1000	>1000
Beclometasone dipropionate (HFA)	100–200	>200–400	>400
Budesonide (DPI)	200–400	>400–800	>800
Ciclesonide (HFA)	80–160	>160–320	>320
Fluticasone furoate (DPI)	100	n.a.	200
Fluticasone propionate (DPI or HFA)	100–250	>250–500	>500
Mometasone furoate	110–220	>220–440	>440
Triamcinolone acetonide	400–1000	>1000–2000	>2000

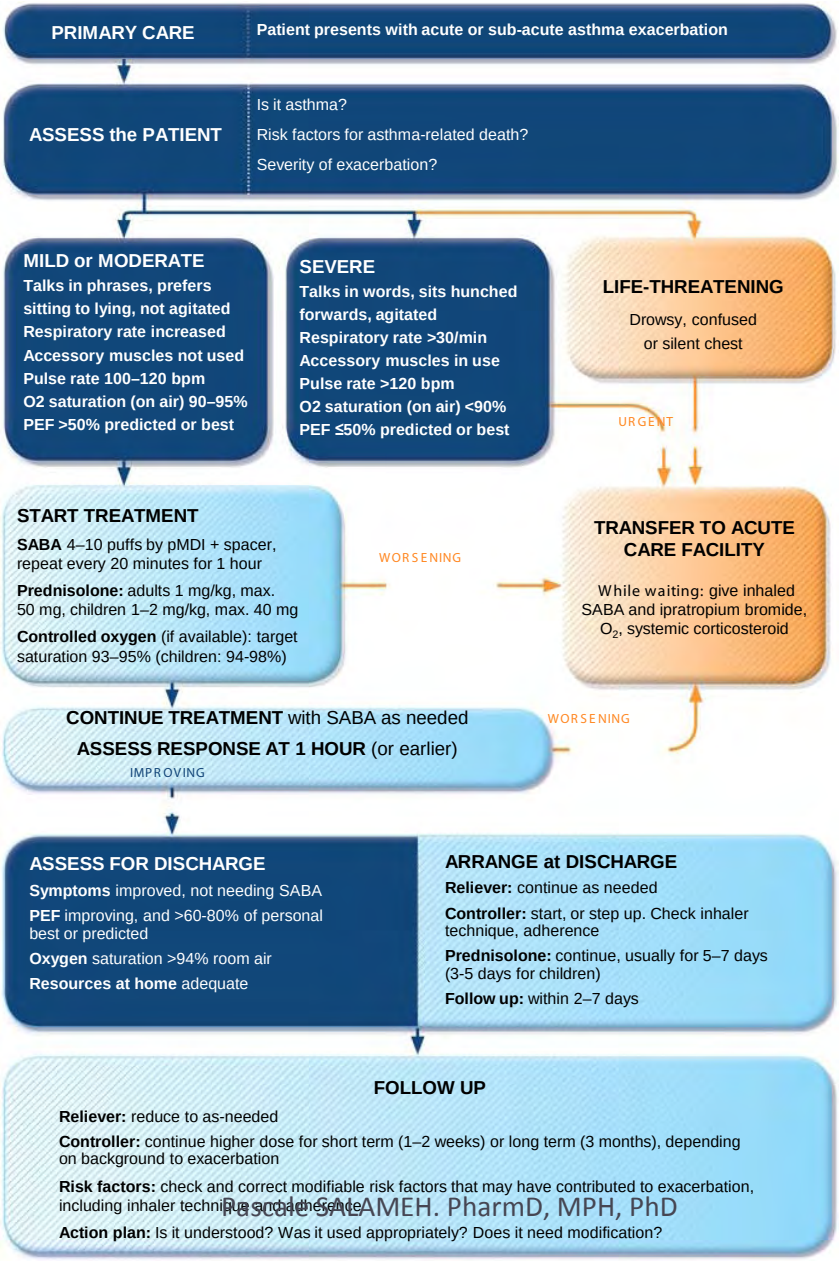
- This is not a table of equivalence, but of estimated clinical comparability
- Most of the clinical benefit from ICS is seen at low doses
- High doses are arbitrary, but for most ICS are those that, with prolonged use, are associated with increased risk of systemic side-effects

Low, Medium and High Dose Inhaled Corticosteroids Children 6–11 years

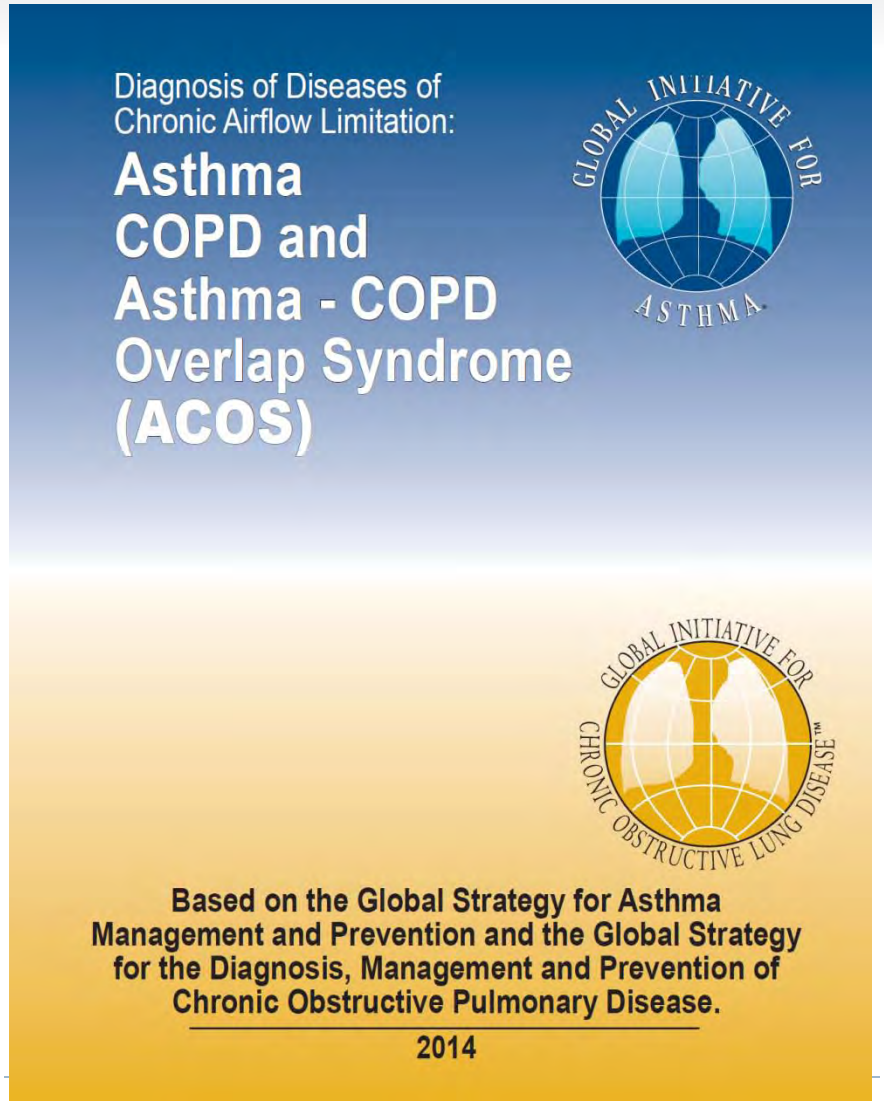
Inhaled corticosteroid	Total daily dose (mcg)		
	Low	Medium	High
Beclometasone dipropionate (CFC)	100–200	>200–400	>400
Beclometasone dipropionate (HFA)	50–100	>100–200	>200
Budesonide (DPI)	100–200	>200–400	>400
Budesonide (nebules)	250–500	>500–1000	>1000
Ciclesonide (HFA)	80	>80–160	>160
Fluticasone furoate (DPI)	n.a.	n.a.	n.a.
Fluticasone propionate (DPI)	100–200	>200–400	>400
Fluticasone propionate (HFA)	100–200	>200–500	>500
Mometasone furoate	110	≥220–<440	≥440
Triamcinolone acetonide	400–800	>800–1200	>1200

- This is not a table of equivalence, but of estimated clinical comparability
- Most of the clinical benefit from ICS is seen at low doses
- High doses are arbitrary, but for most ICS are those that, with prolonged use, are associated with increased risk of systemic side-effects

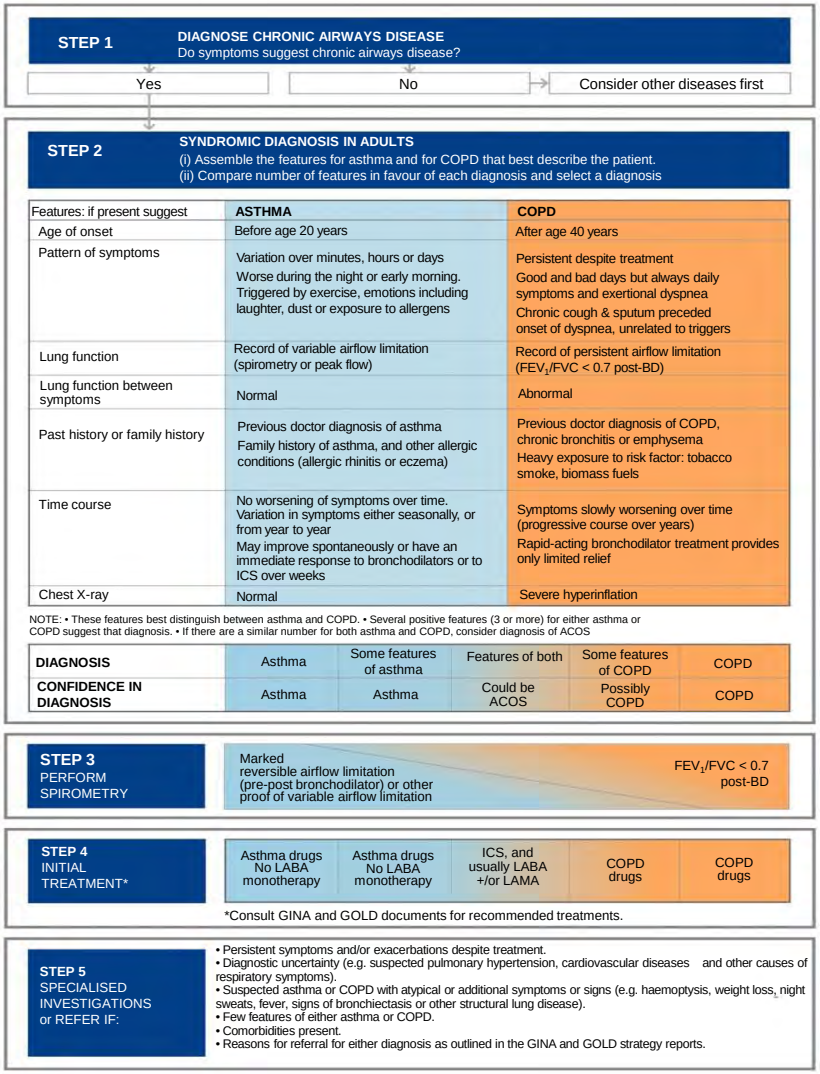
Managing Exacerbations in Primary Care



Diagnosis of Diseases of Chronic Airflow Limitation



Stepwise Approach to Diagnosis and Initial Treatment



STEP 1 DIAGNOSE CHRONIC AIRWAYS DISEASE
Do symptoms suggest chronic airways disease?

Yes → **STEP 2**

No → Consider other diseases first

STEP 2 SYNDROMIC DIAGNOSIS IN ADULTS
(i) Assemble the features for asthma and for COPD that best describe the patient.
(ii) Compare number of features in favour of each diagnosis and select a diagnosis

Features: if present suggest	ASTHMA	COPD
Age of onset	Before age 20 years	After age 40 years
Pattern of symptoms	Variation over minutes, hours or days Worse during the night or early morning. Triggered by exercise, emotions including laughter, dust or exposure to allergens	Persistent despite treatment Good and bad days but always daily symptoms and exertional dyspnea Chronic cough & sputum preceded onset of dyspnea, unrelated to triggers
Lung function	Record of variable airflow limitation (spirometry or peak flow)	Record of persistent airflow limitation ($FEV_1/FVC < 0.7$ post-BD)
Lung function between symptoms	Normal	Abnormal
Past history or family history	Previous doctor diagnosis of asthma Family history of asthma, and other allergic conditions (allergic rhinitis or eczema)	Previous doctor diagnosis of COPD, chronic bronchitis or emphysema Heavy exposure to risk factor: tobacco smoke, biomass fuels
Time course	No worsening of symptoms over time. Variation in symptoms either seasonally, or from year to year May improve spontaneously or have an immediate response to bronchodilators or to ICS over weeks	Symptoms slowly worsening over time (progressive course over years) Rapid-acting bronchodilator treatment provides only limited relief
Chest X-ray	Normal	Severe hyperinflation

NOTE: • These features best distinguish between asthma and COPD. • Several positive features (3 or more) for either asthma or COPD suggest that diagnosis. • If there are a similar number for both asthma and COPD, consider diagnosis of ACOS

DIAGNOSIS	Asthma	Some features of asthma	Features of both	Some features of COPD	COPD
CONFIDENCE IN DIAGNOSIS	Asthma	Asthma	Could be ACOS	Possibly COPD	COPD

STEP 3 PERFORM SPIROMETRY

Marked reversible airflow limitation (pre-post bronchodilator) or other proof of variable airflow limitation → $FEV_1/FVC < 0.7$ post-BD

STEP 4 INITIAL TREATMENT*

Asthma drugs No LABA monotherapy	Asthma drugs No LABA monotherapy	ICS, and usually LABA +/or LAMA	COPD drugs	COPD drugs

*Consult GINA and GOLD documents for recommended treatments.

STEP 5 SPECIALISED INVESTIGATIONS or REFER IF:

- Persistent symptoms and/or exacerbations despite treatment.
- Diagnostic uncertainty (e.g. suspected pulmonary hypertension, cardiovascular diseases and other causes of respiratory symptoms).
- Suspected asthma or COPD with atypical or additional symptoms or signs (e.g. haemoptysis, weight loss, night sweats, fever, signs of bronchiectasis or other structural lung disease).
- Few features of either asthma or COPD.
- Comorbidities present.
- Reasons for referral for either diagnosis as outlined in the GINA and GOLD strategy reports.

For an adult who presents with respiratory symptoms:

1. Does the patient have chronic airways disease?
2. Syndromic diagnosis of asthma, COPD and ACOS
3. Spirometry
4. Commence initial therapy
5. Referral for specialized investigations (if necessary)

STEP 2 — SYNDROMIC DIAGNOSIS IN ADULTS

(i) Assemble the features for asthma and for COPD that best describe the patient.
(ii) Compare number of features in favour of each diagnosis and select a diagnosis

Features: if present suggest -	ASTHMA	COPD
Age of onset	❑ Before age 20 years	❑ After age 40 years
Pattern of symptoms	❑ Variation over minutes, hours or days ❑ Worse during the night or early morning ❑ Triggered by exercise, emotions including laughter, dust or exposure to allergens	❑ Persistent despite treatment ❑ Good and bad days but always daily symptoms and exertional dyspnea ❑ Chronic cough & sputum preceded onset of dyspnea, unrelated to triggers
Lung function	❑ Record of variable airflow limitation (spirometry or peak flow)	❑ Record of persistent airflow limitation (FEV_1/FVC < 0.7 post-BD)
Lung function between symptoms	❑ Normal	❑ Abnormal
Past history or family history	❑ Previous doctor diagnosis of asthma ❑ Family history of asthma, and other allergic conditions (allergic rhinitis or eczema)	❑ Previous doctor diagnosis of COPD, chronic bronchitis or emphysema ❑ Heavy exposure to risk factor: tobacco smoke, biomass fuels
Time course	❑ No worsening of symptoms over time. Variation in symptoms either seasonally, or from year to year ❑ May improve spontaneously or have an immediate response to bronchodilators or to ICS over weeks	❑ Symptoms slowly worsening over time (progressive course over years) ❑ Rapid-acting bronchodilator treatment provides only limited relief
Chest X-ray	❑ Normal	❑ Severe hyperinflation

NOTE: • These features best distinguish between asthma and COPD. • Several positive features (3 or more) for either asthma or COPD suggest that diagnosis. • If there are a similar number for both asthma and COPD, consider diagnosis of ACOS

DIAGNOSIS	Asthma	Some features of asthma	Features of both	Some features of COPD	COPD
CONFIDENCE IN DIAGNOSIS	Asthma	Asthma	Could be ACOS	Possibly COPD	COPD