

IPAG DIAGNOSIS & MANAGEMENT HANDBOOK



Chronic Airways Diseases

A Guide for Primary Care Physicians

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International Primary Care Airways Group (IPAG)



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PREFACE

Chronic airways diseases such as asthma, chronic obstructive pulmonary disease (COPD), and allergic rhinitis are a huge source of morbidity and mortality worldwide, and unlike most other categories of disease, which are decreasing in prevalence, chronic airways diseases are on the increase. There is a great need for more and better care of these diseases.

Primary care clinicians treat the vast majority of patients with chronic airways diseases in most countries. However, global evidence-based practice guidelines are often complicated and recommend the use of resources often not available in the primary care setting worldwide. As a result, primary care clinicians often believe that such guidelines cannot be followed in their practices.

However, management that follows evidence-based practice guidelines yields better patient results. Even when available resources do not permit “ideal practice” care, appropriate management that is consistent with evidence-based practice guidelines and achievable with available resources can still be performed and improve patient care.

Global practice guidelines, such as those produced by the Global Initiative for Asthma (GINA), the Global Initiative for Chronic Obstructive Lung Disease (GOLD), and Allergic Rhinitis and its Impact on Asthma (ARIA), deliberately include a range of appropriate activities in diagnosis, monitoring, and treatment. These management options allow physicians working in a range of practice environments and with different available resources to provide appropriate care.

Thus, this document encourages primary care physicians worldwide to select those practical diagnostic and therapeutic measures from the complete set of recommendations in evidence-based global guidelines that can be carried out in their particular primary care environment, and in this way provide the best possible care for their patients with chronic airways diseases. The preferred way to use the handbook would be through a critical analysis of the population under care and the available resources under prevailing health care conditions. This way, the handbook would become the template of local guidance. Primary care providers can in this way select the most effective interventions that can be accessed, and advocate for facilities that serve the greatest unmet needs of their patients.

The diagnostic and therapeutic procedures recommended in this document are consistent with the GINA, GOLD, and ARIA evidence-based guidelines for asthma, COPD, and allergic rhinitis. The GINA, GOLD, and ARIA guidelines were all updated in 2007, and this revision of the IPAG handbook reflects the new guidelines. However, this document does not provide those guidelines’ detailed perspective on the management of these diseases, and we highly recommend consulting the original guideline documents (available online: GINA, <http://www.ginasthma.org>; GOLD, <http://www.goldcopd.org>; ARIA, <http://www.whiar.org>) for the needed background.

This handbook organizes the process of managing chronic airways diseases into tracks that are tailored to the general practice setting. It describes an approach to diagnosis that helps the general practitioner to diagnose asthma, COPD, and/or allergic rhinitis based on the patient’s presenting airways symptoms and responses to a set of newly developed questionnaires and diagnosis aids. In addition, it specifically addresses the diagnosis and management of asthma in young children, an aspect that is tremendously important in primary care.

The document provides algorithms that assist the user with diagnostic and therapeutic decisions. If asthma, COPD, and/or rhinitis are determined to be likely diagnoses, the clinician can follow the appropriate, color-coded “Diagnosis Tracks” to support these diagnoses. If the clinician determines the diseases to be present, they can follow the appropriate, color-coded “Management Tracks” for these diseases to assess severity and select appropriate therapy.

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DIAGNOSIS

Overview of the IPAG Diagnostic Approach

Diagnosis of the patient with chronic respiratory disease in the primary care setting requires a symptom-based approach and a knowledge of the diseases presenting in the patient population.

To assist in diagnosing patients with chronic airways diseases, a series of Questionnaires has been developed that contain the questions identified in the peer-reviewed literature as having the greatest diagnostic value. These core diagnostic assessment questions assess the likelihood of the presence of the common chronic airways diseases in primary care: asthma, allergic rhinitis, and chronic obstructive pulmonary disease (COPD). They are intended to facilitate structured history taking and to supplement a complete patient history, physical exam, and evaluation.

The Questionnaires are paired with a series of Diagnosis Guides in various "Diagnosis Tracks" to help the clinician further investigate a suspected diagnosis. The Questionnaires and Diagnosis Guides presented here are simply aids in making the clinical diagnosis, and are not intended to substitute for the physician's clinical judgement. The complete differential diagnosis of chronic respiratory disease is extensive and patients for whom a diagnosis cannot be clearly established should be considered for evaluation by an allergist, pulmonologist, or other respiratory specialist.

Gathering the Clinical Database

For cases in which chronic airways disease is suspected, a complete medical history should be taken and physical and laboratory examinations performed. There are several key points that need to be evaluated during this process:

Characterize the Problem

Cough, wheeze, breathlessness, shortness of breath, chest tightness, watery runny nose, and itchy nose (including exercise-related symptoms) are common symptoms of chronic airways diseases among patients presenting in general practice. Once a presentation consistent with airways disease has been established, further characterize the problem in the following three ways:

Establish Chronicity

A "yes" answer to any of these questions suggests the problem is chronic:

- Does the patient have symptoms most months of the year?
- Does the patient have symptoms most days in some months of the year?
- Do the symptoms recur in a regular pattern (i.e., seasonally, monthly, etc.)?

Exclude Non-Respiratory or Other Causes

A "yes" answer in any of the following areas suggests a non-respiratory origin should be considered in children aged 6 years and older and adults:

- Is there evidence of heart disease? (Chest pain, palpitation, edema, paroxysmal nocturnal dyspnea, diaphoresis, etc.)
- Is there evidence of gastro-esophageal reflux? (Indigestion, heartburn, water brash)
- Are there signs of systemic disease or malignancy? (Anemia, recent weight loss, etc.)
- Does the patient have hemoptysis or persisting respiratory symptoms not responding to therapy? (Consider lung cancer or other chronic lung diseases.)

Exclude Infectious Diseases

Chronic respiratory infections may produce symptoms similar to those described above. Tuberculosis, HIV, and fungal or parasitic infections may be common causes of chronic respiratory symptoms in some areas. A "yes" answer to any of the following should raise suspicion of a chronic infectious process:

- Does the patient have fever, chills, or sweats?
- Is the patient losing weight? (For children: is the patient failing to grow?)
- Does the patient produce purulent sputum, or have a purulent nasal discharge?

If these points have been evaluated and chronic airways disease still appears to be a likely cause of the patient's illness, then the IPAG diagnostic aids may help to establish the correct diagnosis.

Using the IPAG Diagnostic Aids

The algorithm shown in **Figure 1** will guide you through the diagnostic process when you have gathered the necessary clinical information.

Consider the Patient's Age

Begin with the patient's age. The epidemiology of airways diseases is strongly correlated with age; thus, separating the general practice population into different subgroups based on age provides a practical initial approach to diagnosis:

- **Children under age 6:** Consider **asthma**. Asthma is primarily a diagnosis of exclusion in this age group. Allergic rhinitis is uncommon in children below 3 years of age.
- **Children age 6-14:** **Asthma** and **allergic rhinitis** are predominant airways diseases. Consider the possibility of asthma in patients who have allergic rhinitis, and vice versa.
- **Adults age 15-39:** **Asthma** and **allergic rhinitis** remain common airways diseases. Again, consider the possibility of asthma in patients who have allergic rhinitis, and vice versa.
- **Adults age 40 and over:** **COPD** becomes the predominant chronic airways disease. However, **asthma** and **allergic rhinitis** do occur. A key challenge in this age group is distinguishing asthma from COPD; a patient's risk factors (especially exposure to tobacco smoke, smoke from biomass fuels, or other noxious fumes at home or work) and history of prior respiratory disease help determine which diagnosis to investigate first.

Summary of Age- and Symptom-Related Initial Approach to Diagnosis

Follow the algorithms based on the patient's age and history.

Patients with only nasal symptoms:

Proceed to Allergic Rhinitis Diagnosis Track (page 4). Follow red color-coded allergic rhinitis diagnostic materials.

Patients with lower airways symptoms:

Children under age 6:
Proceed to Early Childhood Asthma Diagnosis Track (page 6). Follow blue color-coded asthma diagnostic materials.

Children age 6-14:

Proceed to Childhood Asthma Diagnosis Track (page 7). Follow blue color-coded asthma diagnostic materials.

Adults age 15-39:

Proceed to Adult Asthma Diagnosis Track (page 9). Follow blue color-coded asthma diagnostic materials.

Adults age 40 and over:

Smokers (current and former) with no prior history of respiratory disease or current regular respiratory symptoms or treatment:

Proceed to COPD Diagnosis Track (page 11). Follow gold color-coded COPD diagnostic materials.

Non-Smokers or patients with prior diagnosis of respiratory disease or current regular respiratory treatment:

Proceed to Differential Diagnosis Questionnaire (page 13) to determine whether to go to Adult Asthma Diagnosis Track or COPD Diagnosis Track.

When you use the designated Questionnaire, patient-specific information will lead to conclusions that will direct you to the appropriate Diagnosis Guide.

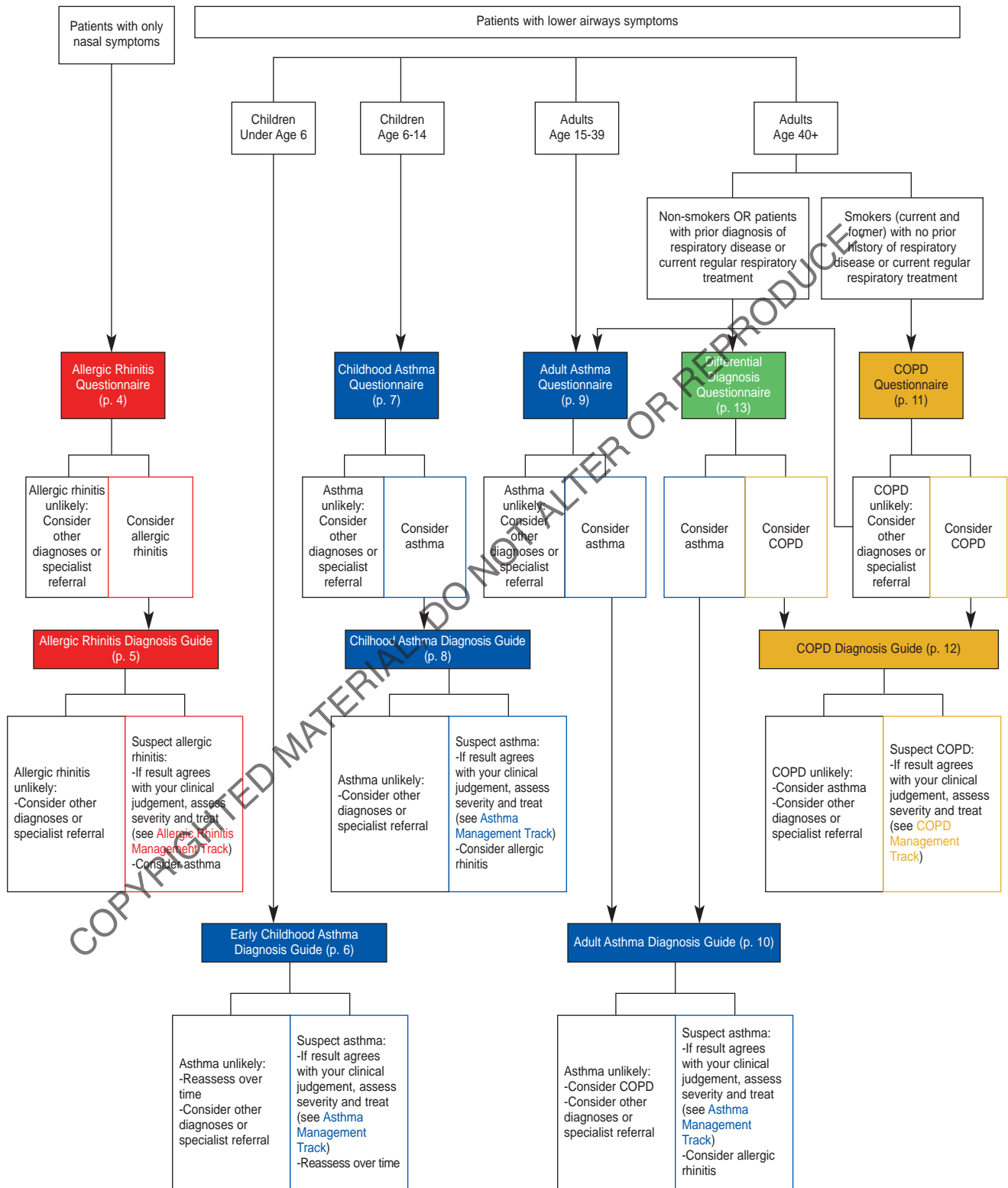
After receiving the direction provided by the Diagnosis Guide in the context of the overall clinical impression, the physician is in a good position to make the correct clinical diagnosis.

Based upon your diagnostic findings, follow up as shown in **Figure 1**.

Once a diagnosis is made, disease severity can be assessed and appropriate treatment arrived at by consulting the Management section of the IPAG Handbook that follows.

Figure 1. Diagnostic Algorithm for Chronic Airways Diseases

Use this chart for patients presenting with: cough, wheeze, breathlessness/shortness of breath, chest tightness, watery runny nose, and/or itchy nose (including exercise-related symptoms).



ALLERGIC RHINITIS DIAGNOSIS TRACK

Allergic Rhinitis Questionnaire

Instructions: To evaluate the possibility of allergic rhinitis, start by asking the questions below.

This questionnaire contains the questions related to allergic rhinitis symptoms that have been identified in peer-reviewed literature as having the greatest diagnostic value. It will not produce a definitive diagnosis, but may enable you to determine whether a diagnosis of allergic rhinitis should be further investigated or is unlikely.

Allergic Rhinitis Questionnaire		
Question	Response Choices	
1. Do you have any of the following symptoms?		
• Symptoms on only one side of your nose	Yes	No
• Thick, green or yellow discharge from your nose (see NOTE)	Yes	No
• Postnasal drip (down the back of your throat) with thick mucus and/or runny nose (see NOTE)	Yes	No
• Facial pain (see NOTE)	Yes	No
• Recurrent nosebleeds	Yes	No
• Loss of smell (see NOTE)	Yes	No
2. Do you have any of the following symptoms for at least one hour on most days (or on most days during the season if your symptoms are seasonal)?		
• Watery runny nose	Yes	No
• Sneezing, especially violent and in bouts	Yes	No
• Nasal obstruction	Yes	No
• Nasal itching	Yes	No
• Conjunctivitis (red, itchy eyes)	Yes	No

REFERENCE: Adapted from Allergic Rhinitis and its Impact on Asthma (ARIA). Workshop Report. 2007. Available from <http://www.whiar.org>.

Evaluation:

- The symptoms described in Question 1 are usually NOT found in allergic rhinitis. The presence of ANY ONE of them—a positive response to any part of Question 1—suggests that alternative diagnoses should be investigated. Consider alternative diagnoses and/or referral to a specialist.
- NOTE: Purulent discharge, postnasal drip, facial pain, and loss of smell are common symptoms of sinusitis. Because most patients with sinusitis also have rhinitis (though not always allergic in origin), in this situation the clinician should also evaluate the possibility of allergic rhinitis.
- The presence of watery runny nose with ONE OR MORE of the other symptoms listed in Question 2 suggests allergic rhinitis, and indicates that the patient should undergo further diagnostic assessment. Proceed to the [Allergic Rhinitis Diagnosis Guide](#), page 5.
- The presence of watery runny nose ALONE suggests that the patient MAY have allergic rhinitis. (Additionally, some patients with allergic rhinitis have only nasal obstruction as a cardinal symptom.) Your clinical judgement will determine whether to proceed to the [Allergic Rhinitis Diagnosis Guide](#) (page 5).
- If the patient has sneezing, nasal itching, and/or conjunctivitis, but NOT watery runny nose, consider alternative diagnoses and/or referral to a specialist.
- In adults with late-onset rhinitis, consider and query occupational causes. Occupational rhinitis frequently precedes or accompanies the development of occupational asthma. Patients in whom an occupational association is suspected should be referred to a specialist for further objective testing and assessment.

Allergic Rhinitis Diagnosis Guide

Instructions: In patients of all ages with lower nasal symptoms only, whose responses to the **Allergic Rhinitis Questionnaire** suggest that this diagnosis should be investigated, use this guide to help you evaluate the possibility of allergic rhinitis. All of the diagnostic investigations presented in this guide may not be available in all areas; in most cases, the combination of those diagnostic investigations that are available and the individual health care professional's clinical judgement will lead to a robust clinical diagnosis. This guide is intended to supplement, not replace, a complete physical examination and thorough medical history.

Allergic Rhinitis Diagnosis Guide	
Diagnostic Tool	Findings that Support Diagnosis
Physical examination	Transverse crease of nose, allergic shiners, allergic salute.
In persistent rhinitis: <ul style="list-style-type: none"> • anterior rhinoscopy using speculum and mirror gives limited information • nasal endoscopy (usually performed by specialist) may be needed to exclude other causes of rhinitis, nasal polyps, and anatomic abnormalities 	Exclusion of other causes.
Trial of therapy	Improvement with antihistamines or intranasal glucocorticosteroid.
Allergy skin testing or measurement of allergen-specific IgE in serum (if symptoms are persistent and/or moderate/severe, or if quality of life is affected)	<ul style="list-style-type: none"> • Confirm presence of atopy. • Specific triggers identified.
Nasal challenge tests (if occupational rhinitis suspected)	Confirm sensitivity to specific triggers.

REFERENCE: Adapted from Allergic Rhinitis and its Impact on Asthma (ARIA). Workshop Report, 2007. Available from <http://www.whiar.org>.

Evaluation:

- If these diagnostic investigations and your clinical judgement support the diagnosis of allergic rhinitis, proceed to the **Allergic Rhinitis Management Track**, page 16.
- If diagnostic investigations and/or your clinical judgement suggest that allergic rhinitis is unlikely, consider other diagnoses or specialist referral.

EARLY CHILDHOOD ASTHMA DIAGNOSIS TRACK

Early Childhood Asthma Diagnosis Guide

Instructions: In children under age 6 with lower airways symptoms, use this guide to help you evaluate the possibility of asthma. All of the diagnostic investigations presented in this guide may not be available in all areas; in most cases, the combination of those diagnostic investigations that are available and the individual health care professional's clinical judgement will lead to a robust clinical diagnosis. This guide is intended to supplement, not replace, a complete physical examination and thorough medical history.

Early Childhood Asthma Diagnosis Guide	
Diagnostic Tool	Findings that Support Diagnosis
Differential diagnosis	The diagnosis of asthma in children under age 6 is primarily one of exclusion. Asthma is not the most common cause of wheezing in young children; the younger the child, the more likely that an alternative cause is responsible for the child's wheezing. The differential diagnosis of asthma in this age group is substantially different from that in older children and is summarized in Figure 2 .
Physical examination	If the child does not appear acutely ill and is growing, and there is no evidence specifically indicating another cause of symptoms, a trial of therapy (see below) is warranted.
Trial of therapy (bronchodilators)	Improvement with treatment supports a diagnosis of asthma. However, other conditions (e.g., congestive heart failure) may cause symptoms similar to asthma and be relieved by bronchodilators. If the patient does NOT improve after a trial of asthma therapy, referral to a specialist for further investigation of other diagnoses is recommended.
Frequent reassessment	Note: When managing young children with a presumptive diagnosis of asthma, health care professionals should always be prepared to reconsider the diagnosis if management is ineffective or if the clinical situation changes. In particular, not all young children who wheeze with viral respiratory infections will develop asthma that persists through childhood, so at some point discontinuation of asthma medication may be warranted.
As the patient gets older, additional diagnostic investigations (detailed in the Childhood Asthma Diagnosis Guide , p. 8) can be performed to confirm or exclude the asthma diagnosis.	<ul style="list-style-type: none"> Lung function testing (most children are unable to perform these tests properly until about age 5): demonstration of reversible airflow limitation, airway hyperresponsiveness, and/or variable airflow limitation. Measurement of allergen-specific IgE in serum or allergy skin testing (high false-negative rate under age 3): confirm presence of atopy, identify specific triggers.

REFERENCE: Adapted from Global Initiative for Asthma (GINA). *Pocket Guide for Asthma Management and Prevention in Children*. 2007. Available from <http://www.ginasthma.org>.

Evaluation:

- If these diagnostic investigations and your clinical judgement support the diagnosis of asthma, proceed to the [Asthma Management Track](#), page 19.
- If diagnostic investigations and/or your clinical judgement suggest that asthma is unlikely, consider other diagnoses or specialist referral.

Figure 2. Differential Diagnosis* of Young Children Presenting with Wheezing

Age	Common	Uncommon	Rare
Less than 6 months	Bronchiolitis Gastro-esophageal reflux	Aspiration pneumonia* Bronchopulmonary dysplasia Congestive heart failure Cystic fibrosis	Asthma Foreign body aspiration
6 months - 2 years	Bronchiolitis Foreign body aspiration	Aspiration pneumonia* Asthma Bronchopulmonary dysplasia Cystic fibrosis Gastro-esophageal reflux	Congestive heart failure
2 - 5 years	Asthma Foreign body aspiration	Cystic fibrosis Gastro-esophageal reflux Viral pneumonia	Aspiration pneumonia* Bronchiolitis Congestive heart failure Gastro-esophageal reflux

REFERENCE: Adapted from Anbar RD, Iannuzzi DM. *The wheezing child*. SUNY Upstate Medical University, Department of Pediatrics Pulmonary Disease Manual. Available from: http://www.ec.hscsy.edu/peds/pulmonary_manual.html.

*The complete procedures for diagnosis of these alternative causes of wheezing are beyond the scope of this document. Further information about the signs and symptoms characteristic of some of these conditions may be found in: British Thoracic Society; Scottish Intercollegiate Guidelines Network. British Guideline on the Management of Asthma. *Thorax* 2003;58(Suppl 1): i1-94. Available from: <http://www.sign.ac.uk/guidelines/fulltext/63/index.html>.

*May be secondary to gastro-esophageal reflux, transient or permanent uncoordinated swallowing or, rarely, tracheo-esophageal fistula.

CHILDHOOD ASTHMA DIAGNOSIS TRACK

Childhood Asthma Questionnaire

Instructions: To evaluate the possibility of asthma in children age 6-14, start by asking the questions below. Given the intermittent nature of asthma symptoms, these questions may need to be asked repeatedly over time to establish the likelihood of asthma.

This questionnaire contains the questions related to asthma symptoms and risk factors that have been identified in peer-reviewed literature as having the greatest diagnostic value. It will not produce a definitive diagnosis, but may enable you to determine whether a diagnosis of asthma should be further investigated or is unlikely.

Childhood Asthma Questionnaire	
Question	Response Choices
1. Have you/has your child had wheezing or whistling in the chest in the last 12 months?	Yes No
2. In the last 12 months, have you/has your child had a dry cough at night, apart from a cough associated with a cold or chest infection?	Yes No
3. Do you/does your child have a history of hay fever or eczema?	Yes No
4. Is there a family history of asthma in your (child's) first-degree relatives?	Yes No
5. Have you/has your child received more than three courses of antibiotics for respiratory symptoms (both upper and lower respiratory tract) in the last 12 months?	Yes No
6. In the last 12 months, has your (child's) chest sounded wheezy during or after exercise?	Yes No
7. In the last 12 months, has your (child's) sleep been disturbed due to wheezing?	Yes No
8. In the last 12 months, has wheezing ever been severe enough to limit your (child's) speech to only one or two words at a time between breaths?	Yes No
9. In the last 12 months, have you/has your child been to a doctor, an emergency room, or a hospital for wheezing?	Yes No

REFERENCES: Frank TL, Frank PI, McNamee R. Assessment of a simple scoring system applied to a screening questionnaire of asthma in children aged 5-15 years. *Eur Respir J* 1999;14:1190-7. Jenkins MA, Clarke JR, Carlin JB, et al. Validation of questionnaire and bronchial hyperresponsiveness against respiratory physician assessment in the diagnosis of asthma. *Int J Epidemiol* 1996;25:609-16. Shaw RA, Crane J, Pearce N, et al. Comparison of a video questionnaire with the IUATLD written questionnaire for measuring asthma prevalence. *Clin Exp Allergy* 1992;22:561-8. Wolf RL, Berry CA, O'Connor T, Coover L. Validation of the Brief Pediatric Asthma Screen. *Chest* 1999;116:224-35.

Evaluation:

- A positive response to any of the questions above suggests an increased likelihood of asthma, and suggests that the patient should undergo further diagnostic assessment. Positive responses to 3 or more of the questions in bold suggest a greater than 90% likelihood of asthma. If responses suggest asthma, proceed to the [Childhood Asthma Diagnosis Guide](#), page 8.
- If responses suggest asthma is unlikely, consider alternative diagnoses and/or referral to a specialist.

Childhood Asthma Diagnosis Guide

Instructions: In children age 6-14, whose responses to the [Childhood Asthma Questionnaire](#) suggest that this diagnosis should be investigated, use this guide to help you evaluate the possibility of asthma. All of the diagnostic investigations presented in this guide may not be available in all areas; in most cases, the combination of those diagnostic investigations that are available and the individual health care professional's clinical judgement will lead to a robust clinical diagnosis. This guide is intended to supplement, not replace, a complete physical examination and thorough medical history.

Childhood Asthma Diagnosis Guide	
Diagnostic Tool	Findings that Support Diagnosis
Physical examination	<ul style="list-style-type: none"> • Expiratory wheeze on auscultation (may or may not be present). • Increased expiratory time (may or may not be present).
Reversibility testing with spirometry or PEF	Demonstration of reversible airflow limitation: <ul style="list-style-type: none"> • FEV₁ improves at least 12% or 200 mL either spontaneously, after inhaled bronchodilator, or after trial of glucocorticosteroid therapy; OR • PEF improves at least 60 L/min (or 20% or more of pre-bronchodilator PEF) after inhalation of a bronchodilator).
Exercise challenge with spirometry or PEF	Demonstration of airway hyperresponsiveness Note: Some children with asthma present only with symptoms associated with exercise.
Home PEF diary (if needed)	Demonstration of variable airflow limitation: <ul style="list-style-type: none"> • Diurnal variation in PEF of more than 20% (with twice-daily readings, more than 10%).
Trial of therapy	Improvement with bronchodilators or with trial of inhaled glucocorticosteroid therapy.
Allergy skin testing or measurement of allergen-specific IgE in serum	<ul style="list-style-type: none"> • Confirm presence of atopy. • Specific triggers identified.

REFERENCE: Adapted from Global Initiative for Asthma (GINA). *Pocket Guide for Asthma Management and Prevention in Children*. 2007. Available from <http://www.ginasthma.org>.

PEF: peak expiratory flow; FEV₁: forced expiratory volume in one second

Evaluation:

- If these diagnostic investigations and your clinical judgement support the diagnosis of asthma, proceed to the [Asthma Management Track](#), page 19.
- If diagnostic investigations and/or your clinical judgement suggest that asthma is unlikely, consider other diagnoses or specialist referral.

ADULT ASTHMA DIAGNOSIS TRACK

Adult Asthma Questionnaire

Instructions: To evaluate the possibility of asthma in adults age 15 and over, start by asking the questions below. Given the intermittent nature of asthma symptoms, these questions may need to be asked repeatedly over time to establish the likelihood of asthma.

This questionnaire contains the questions related to asthma symptoms and risk factors that have been identified in peer-reviewed literature as having the greatest diagnostic value. It will not produce a definitive diagnosis, but may enable you to determine whether a diagnosis of asthma should be further investigated or is unlikely.

Adult Asthma Questionnaire		
Question	Response Choices	
1. Have you had wheezing or whistling in your chest at any time in the last 12 months?	Yes	No
2. Have you been woken up at night by an attack of shortness of breath at any time in the last 12 months?	Yes	No
3. Have you been woken up at night by an attack of coughing at any time in the past 12 months?	Yes	No
4. Have you woken up with a feeling of tightness in your chest at any time in the last 12 months?	Yes	No
5. Have you had an attack of shortness of breath that came on following strenuous activity at any time?	Yes	No
6. Have you had an attack of shortness of breath that came on during the day when you were at rest at any time?	Yes	No
7. If you answered "Yes" to any of the questions above, do your symptoms occur less frequently or not at all on days away from work and on vacations?	Yes	No

REFERENCES: Abramson MJ, Hensley MJ, Saunders NA, Wlodarczyk JH. Evaluation of a new asthma questionnaire. *J Asthma* 1991;28:129-39. Burney PG, Laitinen LA, Perdrizet S, Huckauf H, Tattersfield AE, Chinn S, et al. Validity and repeatability of the IUATLD (1984) Bronchial Symptoms Questionnaire: an international comparison. *Eur Respir J* 1989;2:940-5. Ravault C, Kauffmann P. Validity of the IUATLD (1986) questionnaire in the EGEA study. International Union Against Tuberculosis and Lung Disease. Epidemiological study on the Genetics and Environment of Asthma, bronchial hyperresponsiveness and atopy. *Int J Tuberc Lung Dis* 2001;5:191-6. Sistik D, Tschopp J-M, Schindler C, et al. Clinical diagnosis of current asthma: predictive value of respiratory symptoms in the SAPALDIA study. Swiss Study on Air Pollution and Lung Diseases in Adults. *Eur Respir J* 2001;17:214-9.

Evaluation:

- A positive response to any of the questions 1-6, particularly questions 1 or 2 in bold, suggests an increased likelihood of asthma. The more positive answers, the greater the likelihood of asthma. If in your judgement the patient's responses suggest asthma, proceed to the [Adult Asthma Diagnosis Guide](#), page 10.
- A positive response to question 7 suggests an occupational association. Referral of the patient to a specialist for further objective testing and assessment is recommended.
- If answers suggest asthma is unlikely, consider other diagnoses or specialist referral.

Adult Asthma Diagnosis Guide

Instructions: In adults age 15 and over, whose responses to the [Adult Asthma Questionnaire](#) or [Differential Diagnosis Questionnaire](#) suggest that this diagnosis should be investigated, use this guide to help you evaluate the possibility of asthma. All of the diagnostic investigations presented in this guide may not be available in all areas; in most cases, the combination of those diagnostic investigations that are available and the individual health care professional's clinical judgement will lead to a robust clinical diagnosis. This guide is intended to supplement, not replace, a complete physical examination and thorough medical history.

Adult Asthma Diagnosis Guide	
Diagnostic Tool	Findings that Support Diagnosis
Medical history	In addition to the information elicited in the Adult Asthma Questionnaire and Differential Diagnosis Questionnaire, the following features tend to be characteristic, but do not occur in every case: <ul style="list-style-type: none"> • Onset early in life (often childhood) • Symptoms vary from day to day • Symptoms at night/early morning • Allergy, rhinitis, and/or eczema also present • Family history of asthma.
Physical examination	<ul style="list-style-type: none"> • Expiratory wheeze on auscultation (may or may not be present). • Increased expiratory time (may or may not be present). • Hyperinflation (may or may not be present).
Reversibility testing with spirometry or PEF	Demonstration of reversible airflow limitation: <ul style="list-style-type: none"> • FEV₁ improves at least 12% or 200 ml either spontaneously, after inhaled bronchodilator, or after trial of glucocorticosteroid therapy; OR • PEF improves at least 60 L/min (or 20% or more of pre-bronchodilator PEF) after inhalation of a bronchodilator. (Note: Postbronchodilator FEV ₁ /FVC < 0.70 suggests COPD.)
Exercise challenge with spirometry or PEF	Demonstration of airway hyperresponsiveness
Home PEF diary (if needed)	Demonstration of variable airflow limitation: <ul style="list-style-type: none"> • Diurnal variation in PEF of more than 20% (with twice-daily readings, more than 10%).
Trial of therapy	Improvement with bronchodilators or with trial of glucocorticosteroid therapy.
Allergy skin testing or measurement of allergen-specific IgE in serum	<ul style="list-style-type: none"> • Confirm presence of atopy. • Specific triggers identified.

REFERENCE: Adapted from Global Initiative for Asthma (GINA). *Global Strategy for Asthma Management and Prevention*. 2007. Available from <http://www.ginasthma.org>.

PEF: peak expiratory flow; FEV₁: forced expiratory volume in one second; FVC: forced vital capacity

Evaluation:

- If these diagnostic investigations and your clinical judgement support the diagnosis of asthma, proceed to the [Asthma Management Track](#), page 19.
- If diagnostic investigations and/or your clinical judgement suggest that asthma is unlikely, consider other diagnoses (including COPD, if relevant) or specialist referral.

COPD DIAGNOSIS TRACK

COPD Questionnaire

Instructions: To evaluate the possibility of COPD in adults age 40 and over who have ever smoked cigarettes* AND who have no prior diagnosis of respiratory disease or current regular respiratory treatment, start by asking the questions below.

This questionnaire contains the questions related to COPD symptoms and risk factors that have been identified in peer-reviewed literature as having the greatest diagnostic value. It will not produce a definitive diagnosis, but may enable you to determine whether a diagnosis of COPD should be further investigated or is unlikely.

*Note: exposure to other COPD risk factors (occupational dusts and chemicals or smoke from home cooking and heating fuel) can also cause COPD.

COPD Questionnaire		
Question	Response Choices	Points
1. What is your age in years?	40-49 years	0
	50-59 years	4
	60-69 years	8
	70 years or older	10
2. How many cigarettes do you currently smoke each day (if you are an ex-smoker, how many did you smoke each day)? What is the total number of years you have smoked cigarettes? Packs per day = cigarettes per day/ 20 per pack Pack-years = packs per day X years smoked	0-14 pack-years	0
	15-24 pack-years	2
	25-49 pack-years	3
	50+ pack-years	7
3. What is your weight in kilograms? What is your height in meters? BMI = weight in kg/(height in m) ²	BMI < 25.4	5
	BMI 25.4-29.7	1
	BMI > 29.7	0
4. Does the weather affect your cough?	Yes	3
	No	0
	I do not have a cough	0
5. Do you ever cough up phlegm (sputum) from your chest when you don't have a cold?	Yes	3
	No	0
6. Do you usually cough up phlegm (sputum) from your chest first thing in the morning?	Yes	0
	No	3
7. How frequently do you wheeze?	Never	0
	Occasionally or more often	4
8. Do you have or have you had any allergies?	Yes	0
	No	3

REFERENCE: Price DB, Finkelman DG, Halbert RJ, Nordyke RJ, Isonaka S, Nonikov D, Juniper EF, Freeman D, Hausen T, Levy ML, Ostrem A, van der Molen T, van Schayck CP. Symptom-based questionnaire for identifying COPD in smokers. *Respiration* 2006;73(3):285-95.

Evaluation: Add up the total number of points based on the patient's responses.

- 17 or more points: proceed to the [COPD Diagnosis Guide](#), page 12.
- 16 or fewer points: consider other diagnoses, including asthma (proceed to the [Adult Asthma Questionnaire](#), page 9, if your clinical opinion is that this diagnosis should be investigated), or specialist referral.

COPD Diagnosis Guide

Instructions: In adults age 40 and over, whose responses to the **COPD Questionnaire** or **Differential Diagnosis Questionnaire** suggest that this diagnosis should be investigated, use this guide to help you evaluate the possibility of COPD. All of the diagnostic investigations presented in this guide may not be available in all areas; in most cases, the combination of those diagnostic investigations that are available and the individual health care professional's clinical judgement will lead to a robust clinical diagnosis. This guide is intended to supplement, not replace, a complete physical examination and thorough medical history.

COPD Diagnosis Guide	
Diagnostic Tool	Findings that Support Diagnosis
Physical examination	The following often occur in COPD, but their absence should not be used to rule out the disease and their presence is not specific for it: <ul style="list-style-type: none"> • Expiratory wheeze on auscultation • Increased expiratory time • Hyperinflation.
Spirometry (NOTE: PEF may underestimate airway obstruction; a normal PEF should therefore not be used to exclude a diagnosis of COPD.)	Demonstration of irreversible ⁺ airflow obstruction: <ul style="list-style-type: none"> • $FEV_1/FVC < 0.70^*$ following bronchodilator administration. <p>+ Asthma and COPD may coexist in some patients. Health care professionals should be alert to the possibility of asthma in patients being evaluated for COPD who also have symptoms and history compatible with a diagnosis of asthma. These patients will have airflow obstruction with both a reversible and an irreversible component.</p> <p>* Patients who have a history of exposure to risk factors and chronic symptoms, but normal spirometry, are considered at risk for COPD. Although not all patients at risk will go on to develop COPD, all should be given intensive intervention to reduce exposure to risk factors and prevent progression of the disease.</p>
Trial of therapy	Improvement with bronchodilators.

REFERENCE: Adapted from Global Initiative for Chronic Obstructive Lung Disease (GOLD). *Global Strategy for Diagnosis, Management, and Prevention of COPD*. 2007. Available from <http://www.goldcopd.org>.

PEF: peak expiratory flow; FEV_1 : forced expiratory volume in one second; FVC: forced vital capacity

Evaluation:

- If these diagnostic investigations and your clinical judgement support the diagnosis of COPD, proceed to the **COPD Management Track**, page 25.
- If diagnostic investigations and/or your clinical judgement suggest that COPD is unlikely, consider other diagnoses (including asthma, if relevant) or specialist referral.

DIFFERENTIAL DIAGNOSIS QUESTIONNAIRE

Differential Diagnosis Questionnaire

Instructions: To evaluate the possibility of asthma and COPD in adults age 40 and over who have never smoked OR who have a prior diagnosis of respiratory disease or current regular respiratory treatment, start by asking the questions below.

This questionnaire contains the questions related to airways symptoms and risk factors that have been identified in peer-reviewed literature as having the greatest diagnostic value in distinguishing between asthma and COPD. It will not produce a definitive diagnosis, but may enable you to determine whether a diagnosis of asthma or COPD is more likely in an individual patient; the more likely diagnosis can then be investigated further.

Differential Diagnosis Questionnaire		
Question	Response Choices	Points
What is your age in years?	40-49 years	0
	50-59 years	5
	60-69 years	9
	70 years or older	11
How many cigarettes do you currently smoke each day (if you are an ex-smoker, how many did you smoke each day)? What is the total number of years you have smoked cigarettes? Packs per day = cigarettes per day/ 20 per pack Pack-years = packs per day X years smoked	0-14 pack-years	0
	15-24 pack-years	3
	25-49 pack-years	7
	50+ pack-years	9
Have you coughed more in the past few years?	Yes	0
	No	1
During the past 3 years, have you had any breathing problems that have kept you off work, indoors, at home, or in bed?	Yes	0
	No	3
Have you ever been admitted to the hospital with breathing problems?	Yes	6
	No	0
Have you been short of breath more often in the past few years?	Yes	1
	No	0
On average, how much phlegm (sputum) do you cough up most days?	None, or less than 1 Tbs (15 ml, or 1/2 oz) per day	0
	1 Tbs (15 ml, or 1/2 oz) or more per day	4
If you get a cold, does it usually go to your chest?	Yes	4
	No	0
Are you taking any treatment to help your breathing?	Yes	5
	No	0

REFERENCES: Tinkelman DG, Price DB, Nordyke RJ, Halbert RJ, Isonaka S, Nonikov D, Juniper EF, Freeman D, Hausen T, Levy ML, Ostrem A, van der Molen T, van Schayck CP. Symptom-based questionnaire for differentiating COPD and asthma. *Respiration* 2006;73(3):296-305.

Evaluation: Add up the total number of points based on the patient's responses.

- 18 or fewer points: proceed to the [Adult Asthma Diagnosis Guide](#), page 10.
- 19 or more points: proceed to the [COPD Diagnosis Guide](#), page 12.
- Note: Asthma and COPD may coexist in some patients. These patients are likely to score at least 19 points on this questionnaire and thus be directed to the [COPD Diagnosis Guide](#). Health care professionals should be alert to the possibility of asthma in patients being evaluated for COPD who also have symptoms and history compatible with a diagnosis of asthma.

MANAGEMENT

Overview of the IPAG Management Approach

Management of the patient with chronic airways disease in the primary care setting requires an assessment of the severity of the disease and its appropriate treatment based on evidence-based practice guidelines. Alternative therapeutic options need to be available so that effective management can be undertaken in a broad range of practice environments.

Once the physician has established the patient's diagnosis (see IPAG Diagnosis section), the severity of the disease can be determined based on patient symptoms as well as lung function testing, if available. To assist in treating patients with chronic airways diseases, "Management Track" assessment and treatment modules for different patient groups have been prepared and are presented in this Management section of the IPAG Handbook. These assessment and therapy recommendations have been developed from the GINA, GOLD, and ARIA evidence-based practice guidelines for asthma, COPD, and allergic rhinitis. These core guidelines provide alternative therapeutic approaches that can be implemented in very different practice environments.

The recommendations presented herein provide basic recommendations for management of stable, chronic disease. It is highly recommended that the physician consult the original guideline documents (available online: GINA, <http://www.ginasthma.org>; GOLD, <http://www.goldcopd.org>; ARIA, <http://www.whiar.org>) for important management perspective. These sources should also be consulted for additional information on the management of acute exacerbations of disease and other special clinical circumstances that are not covered in the IPAG Handbook. The IPAG Handbook is intended to help the clinician with basic diagnostic and therapeutic recommendations, and is not intended to substitute for the physician's clinical judgment. The management of chronic airways disease is complex and patients who do not respond and benefit as expected from therapy should be considered for evaluation by an allergist, pulmonologist, or other respiratory specialist.

Gathering the Clinical Database

For chronic airways diseases, a complete medical history should be taken, and physical and laboratory examinations performed, as reviewed in the Diagnosis section. These data are essential for accurate assessment of disease severity and for assessment of the response to therapy. In addition, a complete review of the patient's current medical therapy for respiratory disease is needed to establish the appropriate level of therapy.

Using the IPAG Management Aids

The algorithm shown in **Figure 3** will guide you through the management process when you have gathered the necessary clinical information.

Identify the Appropriate Management Track

Follow the algorithms based on the patient's diagnosis and age.

Patients with Allergic Rhinitis:

Proceed to Allergic Rhinitis Management Track (page 16).

Follow red color-coded allergic rhinitis management materials.

Patients with Asthma:

Proceed to Asthma Management Track (page 19).

Follow blue color-coded asthma management materials.

Patients with COPD:

Proceed to COPD Management Track (Page 25).

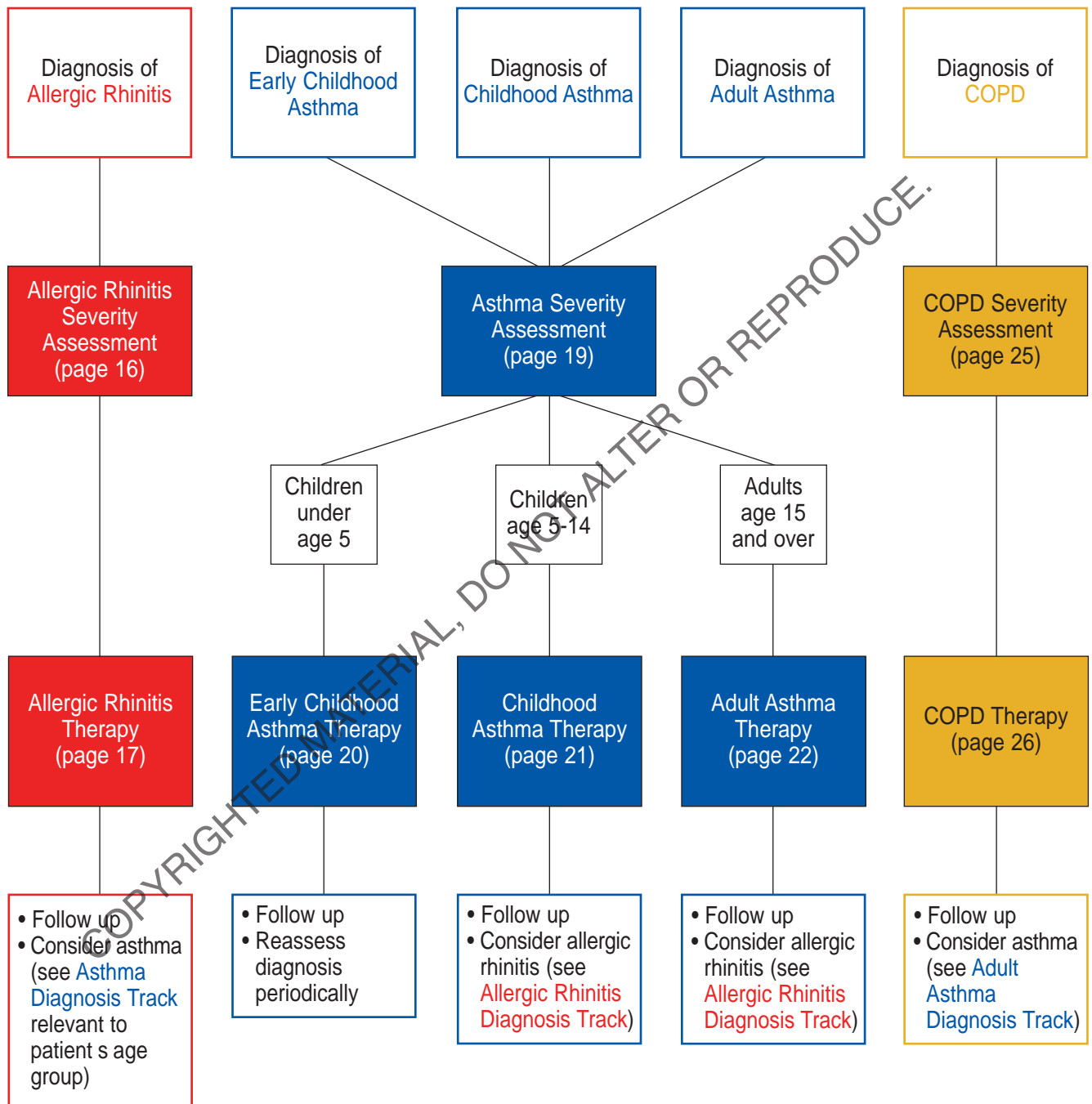
Follow gold color-coded COPD management materials.

When you use the designated severity assessment, patient-specific information will lead to conclusions that will direct your use of the appropriate therapy guide.

After receiving the direction provided by the Management Track in the context of the overall clinical impression, the physician is in an improved position to initiate the appropriate medical management.

Figure 3. Management Algorithm for Chronic Airways Diseases

Use this chart for patients who you believe have allergic rhinitis, asthma, or COPD.



ALLERGIC RHINITIS MANAGEMENT TRACK

Allergic Rhinitis Severity Assessment

Instructions: Once allergic rhinitis is diagnosed, it should be classified as to the pattern, frequency, and duration of symptoms (“Intermittent” or “Persistent”) and the severity and effect of symptoms on the patient’s daily life (“Mild” or “Moderate-Severe”). To classify and evaluate the severity of allergic rhinitis, follow the guidelines in the figure below.

Allergic Rhinitis Severity Assessment	
Step 1: Determine whether the patient’s rhinitis symptoms are Intermittent or Persistent:	
Intermittent symptoms < 4 days per week OR < 4 consecutive weeks	Persistent symptoms > 4 days per week AND > 4 consecutive weeks
Step 2: Determine whether the symptoms are Mild or Moderate-Severe:	
Mild <ul style="list-style-type: none"> • normal sleep • normal daily activities, sport, leisure • normal work and school • symptoms present but not troublesome 	Moderate-Severe <i>one or more items:</i> <ul style="list-style-type: none"> • sleep disturbance • impairment of daily activities, sport, leisure • problems caused at work or school • troublesome symptoms

REFERENCE: Adapted from Allergic Rhinitis and its Impact on Asthma (ARIA). Workshop Report, 2007. Available from <http://www.whiar.org>.

Evaluation: The classification of rhinitis determines the treatment needed; proceed to [Allergic Rhinitis Therapy](#), page 17.

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Allergic Rhinitis Therapy

Instructions: Pharmacologic treatment of allergic rhinitis depends on both the classification of severity and the individual patient's symptoms. In patients with allergic rhinitis, use the figure below to guide you to treatment options appropriate for the individual patient's severity of disease. The choice of pharmacologic treatment may be individualized based on the patient's particular combination of symptoms. Dosage, side effects, and other details about medications for allergic rhinitis are found on page 18. In addition to the pharmacologic treatment listed below, education on avoidance of allergens and other triggers of symptoms (including house dust mites and cigarette smoke; see Appendix, page 28, for details about smoking cessation) and other topics is an integral part of allergic rhinitis management.

Allergic Rhinitis Therapy*	
Classification	Therapy
Mild Intermittent Allergic Rhinitis	<p>Not in preferred order:</p> <ul style="list-style-type: none"> • Second-generation oral H1-blocker • Or Intranasal H1-blocker • And/or decongestant • Or antileukotriene <p>Review patient after 2-4 weeks. If improved: Consider stepping down therapy. If failure: Review diagnosis, review compliance, query infections and other causes, then consider trial of different treatment option or step up therapy (See Moderate/Severe Intermittent Allergic Rhinitis below).</p>
Moderate/Severe Intermittent Allergic Rhinitis and Mild Persistent Allergic Rhinitis	<p>Not in preferred order:</p> <ul style="list-style-type: none"> • Second-generation oral H1-blocker • Or intranasal H1-blocker • And/or decongestant • Or intranasal glucocorticosteroid • Or antileukotriene • (Or cromone) • In Persistent Allergic Rhinitis also consider specialist referral for specific immunotherapy <p>Review patient after 2-4 weeks. If improved: In Intermittent Rhinitis, consider stepping down therapy. In Persistent Rhinitis, continue treatment for at least 1 month after symptoms resolve, then consider stepping down dose. If failure: Review diagnosis, review compliance, query infections and other causes, then consider trial of different treatment option, step up therapy, or specialist referral.</p>
Moderate/Severe Persistent Allergic Rhinitis	<p>In preferred order:</p> <ul style="list-style-type: none"> • Intranasal glucocorticosteroid • H1-blocker • Or antileukotriene • Consider specialist referral for specific immunotherapy <p>Review patient after 2-4 weeks. If improved: Continue treatment for at least 1 month after symptoms resolve. Consider stepping down dose. If failure: Review diagnosis, review compliance, query infections and other causes, then: <ul style="list-style-type: none"> • Add or increase nasal steroid dose, consider trial of different treatment option, or consider specialist referral • If rhinorrhea: add ipratropium • If blockage: Add decongestant or short course of oral steroids (If failure: consider specialist referral). </p>
All categories	<p>If ocular symptoms, add:</p> <ul style="list-style-type: none"> • Oral H1-blocker • Or intraocular H1-blocker • Or intraocular cromone • (Or saline)

REFERENCE: Adapted from Allergic Rhinitis and its Impact on Asthma (ARIA). Workshop Report. 2007. Available from <http://www.whiar.org>.

*Consult the [Allergic Rhinitis Medication Guide](#) on page 18 for dosage, side effects, and other details about medications for allergic rhinitis.

Followup and Ongoing Care: Follow up as indicated in the figure above. Consult the [Allergic Rhinitis Medication Guide](#) (page 18) for details about therapy options. Consider specialist referral if response to pharmacologic therapy is poor or if symptoms persist for more than three months.

In addition, consider whether the patient may also have asthma. Allergic rhinitis and asthma often coexist. If your clinical opinion is that this diagnosis should be investigated, proceed to the [Asthma Diagnosis Track](#) relevant for your patient's age group.

Allergic Rhinitis Medication Guide

Name and Also Known As	Generic Name	Mechanism of Action	Side Effects	Comments
Oral H1-blockers H1-antihistamines	2nd generation Cetirizine Ebastine Fexofenadine Loratadine Mizolastine Acrivastine Azelastine Mequitazine New products Desloratadine Levocetirizine Rupatadine	- blockage of H1 receptor - some anti-allergic activity - new generation drugs can be used once daily - no development of tachyphylaxis	2nd generation - no sedation for most drugs - no anti-cholinergic effect - no cardiotoxicity - acrivastine has sedative effects - oral azelastine may induce sedation and a bitter taste	- first-line therapy except in Moderate/Severe Persistent Allergic Rhinitis - second generation oral H1-blockers are preferred for their favorable efficacy/safety ratio and pharmacokinetics; first generation molecules are no longer recommended because of their unfavorable safety/efficacy ratio - rapidly effective (less than 1 hr) on nasal and ocular symptoms - moderately effective on nasal congestion - cardiotoxic drugs (astemizole, terfenadine) are no longer marketed in most countries
Local H1-blockers (Intranasal, intraocular)	Azelastine Levocabastine Olopatadine	- blockage of H1 receptor - some anti-allergic activity for azelastine	- minor local side effects - azelastine: bitter taste in some patients	- rapidly effective (< 30 mins) on nasal or ocular symptoms
Intranasal glucocorticosteroids	Beclomethasone dipropionate Budesonide Ciclesonide Flunisolide Fluticasone propionate Fluticasone furoate Mometasone furoate Triamcinolone acetonide	- potently reduce nasal inflammation - reduce nasal hyperreactivity	- minor local side effects - wide margin for systemic side effects - growth concerns with BDP only - in young children consider the combination of intranasal and inhaled drugs	- the most effective pharmacological treatment of allergic rhinitis; first-line treatment for Moderate/Severe Persistent Allergic Rhinitis - effective on nasal congestion - effective on smell - effect observed after 6-12 hrs but maximal effect after a few days - patients should be advised on the proper method of administering intranasal glucocorticosteroids, including the importance of directing the spray laterally rather than medially (toward the septum) in the nose
Oral/IM (intramuscular) glucocorticosteroids	Dexamethasone Hydrocortisone Methylprednisolone Prednisolone Prednisone Triamcinolone Betamethasone Deflazacort	- potently reduce nasal inflammation - reduce nasal hyperreactivity	- systemic side effects common in particular for IM drugs - depot injections may cause local tissue atrophy	- when possible, intranasal glucocorticosteroids should replace oral or IM drugs - however, a short course of oral glucocorticosteroids may be needed with moderate/severe symptoms
Local cromones (intranasal, intraocular)	Cromoglycate Nedocromil Naaga	- mechanism of action poorly known	- minor local side effects	- intraocular cromones are very effective - intranasal cromones are less effective and their effect is short-lasting - overall excellent safety
Oral decongestants	Ephedrine Phenylephrine Phenylpropanolamine Pseudoephedrine Oral H1-antihistamine-decongestant combination	- sympathomimetic drugs - relieve symptoms of nasal congestion	- hypertension - palpitations - restlessness - agitation - tremor - insomnia - headache - dry mucous membranes - urinary retention - exacerbation of glaucoma or thyrotoxicosis	- use oral decongestants with caution in patients with heart disease - Oral H1-blocker-decongestant combination products may be more effective than either product alone but side effects are combined
Intranasal decongestants	Oxymethazoline Others	- sympathomimetic drug - relieve symptoms of nasal congestion	- same side effects as oral decongestants but less intense - rhinitis medicamentosa (a rebound phenomenon occurring with prolonged use over 10 days)	- act more rapidly and more effectively than oral decongestants - limit duration of treatment to less than 10 days to avoid rhinitis medicamentosa
Intranasal anticholinergics	Ipratropium	- anticholinergics block almost exclusively rhinorrhea	- minor local side effects - almost no systemic anticholinergic activity	- effective in allergic and non-allergic patients with rhinorrhea
Antileukotrienes	Montelukast Pranlukast Zafirlukast	- block CystLT receptor	- well tolerated	- effective on rhinitis and asthma - effective on all symptoms of rhinitis and on ocular symptoms

REFERENCE: Adapted from Allergic Rhinitis and its Impact on Asthma (ARIA). Workshop Report. 2007. Available from <http://www.whiar.org>.

ASTHMA MANAGEMENT TRACK

Asthma Severity Assessment

Instructions: Once asthma has been diagnosed, the patient's level of asthma control should be assessed, as detailed in the figure below.

Measures of lung function may not be available in all settings, and young children are generally unable to perform these tests properly. In these cases, a careful history, physical examination, and assessment of symptoms will generally provide the information necessary to determine the level of asthma control.

Levels of Asthma Control			
Characteristic	Controlled (All of the following)	Partly Controlled (Any measure present in any week)	Uncontrolled
Daytime symptoms	None (twice or less/week)	More than twice/week	Three or more features of partly controlled asthma present in any week
Limitations of activities	None	Any	
Nocturnal symptoms / awakening	None	Any	
Need for reliever/ rescue treatment	None (twice or less/week)	More than twice/week	
Lung function (PEF or FEV ₁) [‡]	Normal	< 80% predicted or personal best (if known)	
Exacerbations	None	One or more/year*	

* Any exacerbation should prompt review of maintenance treatment to ensure that it is adequate.

[†] By definition, an exacerbation in any week makes that an uncontrolled asthma week.

[‡] Lung function testing is not reliable for children 5 years and younger.

REFERENCE: Adapted from Global Initiative for Asthma (GINA). *Global Strategy for Asthma Management and Prevention*. 2007. Available from <http://www.ginasthma.org>.

PEF: peak expiratory flow; FEV₁: forced expiratory volume in one second

Evaluation: The level of asthma control and the patient's age determine the treatment needed.

- Children under age 5: proceed to [Early Childhood Asthma Therapy](#), page 20.
- Children age 5-14: proceed to [Childhood Asthma Therapy](#), page 21.
- Adults 15 and over: proceed to [Adult Asthma Therapy](#), page 22.

Therapy For Asthma Attacks

Exacerbations of asthma (asthma attacks) are episodes of a progressive increase in shortness of breath, cough, wheezing, or chest tightness, or a combination of these symptoms. Initial treatment of an asthma attack involves increasing the dose of reliever medication (e.g., inhaled rapid-acting beta2-agonist up to 3 treatments in 1 hour). Oral glucocorticosteroids should be added in all but the mildest exacerbations. Hospital admission should be considered if: the patient is at high risk for asthma-related death; the exacerbation is severe (e.g., PEF remains less than 60 percent of predicted or personal best after initial beta2-agonist therapy); the response to the bronchodilator is not prompt and sustained for at least 3 hours; there is no improvement within 2 to 6 hours after glucocorticosteroid treatment is started; or there is further deterioration. For further information on treatment of asthma attacks, refer to the Global Initiative for Asthma (GINA) *Global Strategy for Asthma Management and Prevention*, available at <http://www.ginasthma.org>.

Long-Term Asthma Therapy: Young Children

Instructions: Asthma is treated in a stepwise manner to achieve and maintain control of the disease. The number and frequency of medications increase (step up) as the need for asthma therapy increases, and decrease (step down) when asthma is under control. Use the table below to help guide you to appropriate treatment for children under age 5 with asthma. Dosage, side effects, and other details about medications for asthma are found on page 23. Instructions for the use of various inhaler and spacer devices are available online at <http://www.ginasthma.org>.

In young children, it is difficult to predict and regulate the need for reliever therapy, so more emphasis is placed on early introduction of daily controller treatment rather than reliance on “as-needed” rescue medications. Although in young children there is the possibility of overtreatment, episodes of wheezing may be shortened and reduced in intensity by the effective use of anti-inflammatory medications and bronchodilators rather than antibiotics.

In addition to the pharmacologic therapy detailed below, consider recommending influenza vaccination. Finally, children and carers should be advised about how to avoid exposure to risk factors or “triggers” (allergens and irritants, including cigarette smoke, that make asthma worse).

Early Childhood Asthma Therapy*	
Reliever Medication (take as needed to relieve symptoms, but not more than 3-4 times a day)	
All steps	<ul style="list-style-type: none"> • Rapid-acting inhaled beta2-agonist (OR inhaled anticholinergics OR short-acting oral beta2-agonists OR some long-acting beta2-agonists OR short-acting theophylline)
Controller Medication (take daily regardless of symptoms)	
Step 1	<ul style="list-style-type: none"> • None
Step 2	<ul style="list-style-type: none"> • Low-dose inhaled glucocorticosteroid (OR sustained-release theophylline OR cromone OR leukotriene modifier)
Step 3 and higher	<ul style="list-style-type: none"> • Cautiously increase dose of inhaled glucocorticosteroid • Therapeutic options have not been adequately studied in this age group

REFERENCE: Adapted from Global Initiative for Asthma (GINA). *Pocket Guide for Asthma Management and Prevention in Children*. 2007. Available from <http://www.ginasthma.org>.

*Consult the [Asthma Medication Guide](#) on page 23 for dosage, side effects, and other details about medications for asthma.

An Inhaled Glucocorticosteroid Dosing Guide is found on page 24.

Followup and Ongoing Care: Once control of asthma is achieved and maintained for at least 3 months, a gradual reduction of the maintenance therapy should be tried to identify the minimum therapy required to maintain control. Because asthma is a variable disease, treatment may need to be stepped up or down periodically. Consult the [Asthma Medication Guide](#) (page 23) for details about therapy options. Inhaler technique should be checked at each follow-up visit.

In young children, the diagnosis of asthma may not be definitive, requiring the primary care physician to be vigilant that alternative diagnoses may still need to be considered.

Long-Term Asthma Therapy: Children

Instructions: Asthma is treated in a stepwise manner to achieve and maintain control of the disease. The number and frequency of medications increase (step up) as the need for asthma therapy increases, and decrease (step down) when asthma is under control. Use the table below to help guide you to appropriate treatment for children age 5-14 with asthma. Dosage, side effects, and other details about medications for asthma are found on page 23. Instructions for the use of various inhaler and spacer devices are available online at <http://www.ginasthma.org>.

In addition to the pharmacologic therapy detailed below, consider recommending influenza vaccination. Finally, children and carers should be advised about how to avoid exposure to risk factors or “triggers” (allergens and irritants, including cigarette smoke, that make asthma worse).

Childhood Asthma Therapy*	
Reliever Medication (take as needed to relieve symptoms, but not more than 3-4 times a day)	
All steps	<ul style="list-style-type: none"> • Rapid-acting inhaled beta2-agonist (OR inhaled anticholinergics OR short-acting oral beta2-agonists OR some long-acting beta2-agonists OR short-acting theophylline)
Controller Medication (take daily regardless of symptoms)	
Step 1	<ul style="list-style-type: none"> • None
Step 2	<ul style="list-style-type: none"> • Low-dose inhaled glucocorticosteroid (OR leukotriene modifier)
Step 3	<ul style="list-style-type: none"> • Low-dose inhaled glucocorticosteroid AND • Long-acting inhaled beta2-agonist (OR medium- or high-dose inhaled glucocorticosteroid OR low-dose inhaled glucocorticosteroid plus leukotriene modifier OR low-dose inhaled glucocorticosteroid plus sustained-release theophylline)
Step 4	ADD one or more to Step 3 treatment: <ul style="list-style-type: none"> • Medium-or high-dose inhaled glucocorticosteroid plus long-acting beta2-agonist • Leukotriene modifier • Sustained-release theophylline
Step 5	ADD one or both to Step 4 treatment: <ul style="list-style-type: none"> • Oral glucocorticosteroid (lowest dose) • Anti-IgE treatment

REFERENCE: Adapted from Global Initiative for Asthma (GINA). *Pocket Guide for Asthma Management and Prevention in Children*. 2007. Available from <http://www.ginasthma.org>.

*Consult the [Asthma Medication Guide](#) on page 23 for dosage, side effects, and other details about medications for asthma.

An Inhaled Glucocorticosteroid Dosing Guide is found on page 24.

Followup and Ongoing Care: Once control of asthma is achieved and maintained for at least 3 months, a gradual reduction of the maintenance therapy should be tried to identify the minimum therapy required to maintain control. Because asthma is a variable disease, treatment may need to be stepped up or down periodically. Consult the [Asthma Medication Guide](#) (page 23) for details about therapy options. Inhaler technique should be checked at each follow-up visit.

In addition, consider whether the patient may also have allergic rhinitis. Optimal management of rhinitis may improve coexisting asthma. If your clinical opinion is that this diagnosis should be investigated, proceed to the [Allergic Rhinitis Diagnosis Track](#).

Long-Term Asthma Therapy: Adults

Instructions: Asthma is treated in a stepwise manner to achieve and maintain control of the disease. The number and frequency of medications increase (step up) as the need for asthma therapy increases, and decrease (step down) when asthma is under control. Use the table below to help guide you to appropriate treatment for adults (over age 15) with asthma. Dosage, side effects, and other details about medications for asthma are found on page 23. Instructions for the use of various inhaler and spacer devices are available online at <http://www.ginasthma.org>.

In addition to the pharmacologic therapy detailed below, consider recommending influenza vaccination. Finally, patients should be advised about how to avoid exposure to risk factors or “triggers” (allergens and irritants, including cigarette smoke, that make asthma worse). Management of asthma should include intensive intervention to promote smoking cessation, if relevant (for details about smoking cessation, see Appendix, page 28).

Adult Asthma Therapy*	
Reliever Medication (take as needed to relieve symptoms, but not more than 3-4 times a day)	
All steps	<ul style="list-style-type: none"> • Rapid-acting inhaled beta2-agonist (OR inhaled anticholinergics OR short-acting oral beta2-agonists OR some long-acting beta2-agonists OR short-acting theophylline)
Controller Medication (take daily regardless of symptoms)	
Step 1	<ul style="list-style-type: none"> • None
Step 2	<ul style="list-style-type: none"> • Low-dose inhaled glucocorticosteroid (OR leukotriene modifier)
Step 3	<ul style="list-style-type: none"> • Low-dose inhaled glucocorticosteroid AND • Long-acting inhaled beta2-agonist (OR medium- or high-dose inhaled glucocorticosteroid OR low-dose inhaled glucocorticosteroid plus leukotriene modifier OR low-dose inhaled glucocorticosteroid plus sustained-release theophylline)
Step 4	ADD one or more to Step 3 treatment: <ul style="list-style-type: none"> • Medium- or high-dose inhaled glucocorticosteroid plus long-acting beta2-agonist • Leukotriene modifier • Sustained-release theophylline
Step 5	ADD one or both to Step 4 treatment: <ul style="list-style-type: none"> • Oral glucocorticosteroid (lowest dose) • Anti-IgE treatment

REFERENCE: Adapted from Global Initiative for Asthma (GINA). *Global Strategy for Asthma Management and Prevention*. 2007. Available from <http://www.ginasthma.org>.

*Consult the [Asthma Medication Guide](#) on page 23 for dosage, side effects, and other details about medications for asthma.

An Inhaled Glucocorticosteroid Dosing Guide is found on page 24.

Followup and Ongoing Care: Once control of asthma is achieved and maintained for at least 3 months, a gradual reduction of the maintenance therapy should be tried to identify the minimum therapy required to maintain control. Because asthma is a variable disease, treatment may need to be stepped up or down periodically. Consult the [Asthma Medication Guide](#) (page 23) for details about therapy options. Inhaler technique should be checked at each follow-up visit.

In addition, consider whether the patient may also have allergic rhinitis. Optimal management of rhinitis may improve coexisting asthma. If your clinical opinion is that this diagnosis should be investigated, proceed to the [Allergic Rhinitis Diagnosis Track](#).

Asthma Medication Guide - Controller Medications

Name and Also Known As	Usual Doses	Side Effects	Comments
Glucocorticosteroids Adrenocorticoids Corticosteroids Glucocorticoids Inhaled: Beclomethasone Budesonide Ciclesonide Flunisolide Fluticasone Mometasone furoate Triamcinolone Tablets or syrups: Hydrocortisone Methylprednisolone Prednisolone Prednisone	Inhaled: Beginning dose dependent on asthma control then titrated down over 2-3 months to lowest effective dose once control is achieved. Tablets or syrups: For daily control use lowest effective dose 5-40 mg of prednisone equivalent in a.m. or qod. For acute attacks 40-60 mg daily in 1 or 2 divided doses for adults or 1-2 mg/kg daily in children.	Inhaled: High daily doses may be associated with skin thinning and bruises, and rarely adrenal suppression. Local side effects are hoarseness and oropharyngeal candidiasis. Medium and high doses have produced minor growth delay or suppression (av. 1cm) in children. Attainment of predicted adult height does not appear to be affected. Tablets or syrups: Used long-term, may lead to osteoporosis, hypertension, diabetes, cataracts, adrenal suppression, growth suppression, obesity, skin thinning or muscle weakness. Consider coexisting conditions that could be worsened by oral glucocorticosteroids, e.g., herpes virus infections, Varicella, tuberculosis, hypertension, diabetes, and osteoporosis.	Inhaled: Potential but small risk of side effects is well balanced by efficacy. Spacer devices with MDIs and mouth washing with DPIs after inhalation decrease oral candidiasis. Preparations not equivalent on per puff or μg basis (see Inhaled Glucocorticosteroid Dosing Guide, page 24). Tablet or syrup: Long-term use: alternate-day a.m. dosing produces less toxicity. Short-term: 3-10 day "bursts" are effective for gaining prompt control.
Sodium cromoglycate Cromolyn Cromones	MDI 2 mg or 5 mg 2-4 inhalations 3-4 times daily. Nebulizer 20 mg 3-4 times daily.	Minimal side effects. Cough may occur upon inhalation.	May take 4-6 weeks to determine maximum effects. Frequent daily dosing required.
Nedocromil Cromones	MDI 2 mg/puff 2-4 inhalations 2-4 times daily.	Cough may occur upon inhalation.	Some patients unable to tolerate the taste.
Long-acting beta2-agonists Beta-adrenergics Sympathomimetics LABAs Inhaled: Formoterol (F) Salmeterol (Sm) Sustained-release tablets: Salbutamol (S) Terbutaline (T)	Inhaled: DPI-F: 1 inhalation (12 μg) bid. MDI-F: 2 puffs bid. DPI-Sm: 1 inhalation (50 μg) bid. MDI-Sm: 2 puffs bid. Tablets: S: 4 mg q12h. T: 10 mg q12h.	Inhaled: fewer, and less significant, side effects than tablets. Have been associated with an increased risk of severe exacerbations and asthma deaths when added to usual therapy. Tablets: may cause tachycardia, anxiety, skeletal muscle tremor, headache, hypokalemia.	Inhaled: Salmeterol NOT to be used to treat acute attacks. Should not use as monotherapy or controller therapy. Always use as adjunct to ICS therapy. Formoterol has onset similar to salbutamol and has been used as needed for acute symptoms. Tablets: As effective as sustained-release theophylline. No data for use as adjunctive therapy with inhaled glucocorticosteroids.
Sustained-release theophylline Aminophylline Methylxanthine Xanthine	Starting dose 10 mg/kg/day with usual 800 mg maximum in 1-2 divided doses.	Nausea and vomiting are most common. Serious effects occurring at higher serum concentrations include seizures, tachycardia, and arrhythmias.	Theophylline level monitoring is often required. Absorption and metabolism may be affected by many factors, including febrile illness.
Antileukotrienes Leukotriene modifiers Montelukast (M) Pranlukast (P) Zafirlukast (Z) Zileuton (Zi)	Adults: M 10 mg qhs. P 450 mg bid. Z 20 mg bid. Zi 600 mg qid. Children: M 5 mg qhs (6-14 y). M 4 mg qhs (2-5 y). Z 10 mg bid (7-11 y). 6/ 100, 200 1 inhalation bid (DPI); 4.5/80, 160 2 puffs bid (MDI)	No specific adverse effects to date at recommended doses. Elevation of liver enzymes with Z and Zi and limited case reports of reversible hepatitis and hyperbilirubinemia with Zi and hepatic failure with Z.	Antileukotrienes are most effective for patients with mild persistent asthma. They provide additive benefit when added to ICSs though not as effective as inhaled long-acting beta2-agonists.
Combination long-acting beta2-agonist plus glucocorticosteroid in one inhaler Formoterol/Budesonide (F/B) Salmeterol/Fluticasone (S/F)	F/B (μg): 6/ 100, 200 1 inhalation bid (DPI); 4.5/80, 160 2 puffs bid (MDI) S/F (μg): 50/100, 250, 500 1 puff bid (DPI) 25/50, 125, 250 2 puffs bid (MDI)	Similar to those described above for individual components of the combination.	In moderate to severe persistent asthma, combination more effective than doubling the ICS dose. Budesonide/formoterol has been approved for adjustable as needed dosing in addition to regular dosing in some countries. Dosing is dependent on level of control. Limited data in children 4-11 yrs. No data in children < 4 yrs.
Immunomodulators Omalizumab Anti-IgE	Adults: Dose administered subcutaneously every 2 or 4 weeks dependent on weight and IgE concentration	Pain and bruising at injection site (5-20%) and very rarely anaphylaxis (0.1%).	Need to be stored under refrigeration 2-8 °C and maximum of 150 mg administered per injection site.

Asthma Medication Guide - Reliever Medications

Rapid-acting beta2-agonists Adrenergics β -stimulants Sympathomimetics Albuterol/Salbutamol Fenoterol Levalbuterol Metaproterenol Pirbuterol Terbutaline	Differences in potency exist but products are essentially comparable on a per puff basis. For prn symptomatic use and pretreatment before exercise 2 puffs MDI or 1 inhalation DPI.	Inhaled: tachycardia, skeletal muscle tremor, headache, and irritability. At very high dose hyperglycemia, hypokalemia. Systemic administration as tablets or syrup increases the risk of these side effects.	Drug of choice for acute bronchospasm. Inhaled route has faster onset and is more effective than tablet or syrup. Increasing use, lack of expected effect, or use of > 1 canister a month indicate poor asthma control; adjust long-term therapy accordingly. Use of ≥ 2 canisters per month is associated with an increased risk of a severe, life-threatening asthma attack.
Anticholinergics Ipratropium bromide (IB) Oxitropium bromide	2-3 puffs q 6 hours in adults; 1-2 puffs q 6 hours in children. For acute attacks: IB-MDI 4-6 puffs q6h or q20min in the emergency department. Nebulizer 500 mcg q20min X 3 then q2-4hrs for adults and 250-500 mcg for children.	Minimal mouth dryness or bad taste in the mouth.	May provide additive effects to beta2-agonists but have slower onset of action. An alternative for patients with intolerance for beta2-agonists.
Short-acting theophylline Aminophylline	7 mg/kg loading dose over 20 min followed by 0.4 mg/kg/hr continuous infusion.	Nausea, vomiting, headache. At higher serum concentrations: seizures, tachycardia, and arrhythmias.	Theophylline level monitoring is required. Obtain serum levels 12 and 24 hours into infusion. Maintain between 10-15 $\mu\text{g}/\text{ml}$.

REFERENCE: Adapted from Global Initiative for Asthma (GINA). *Pocket Guide for Asthma Management and Prevention*. 2007. Available from <http://www.ginasthma.org>. National Asthma Education and Prevention Program. *Guidelines for the Diagnosis and Management of Asthma-Update on Selected Topics 2002*. 2002. Available from: <http://www.nhlbi.nih.gov/guidelines/asthma/>.

MDI: metered-dose inhaler; DPI: dry powder inhaler

Inhaled Glucocorticosteroid Dosing Guide

Drug	Adults Daily dose (µg) [†]			Children Daily dose (µg) [†]		
	Low	Medium	High [‡]	Low	Medium	High [‡]
Beclomethasone dipropionate	200-500	500-1000	1000-2000	100-200	200-400	>400
Budesonide*	200-400	400-800	800-1600	100-200	200-400	>400
Budesonide-Neb Inhalation suspension (children only)				250-500	500-1000	>1000
Ciclesonide*	80-160	160-320	320-1280	80-160	160-320	>320
Flunisolide	500-1000	1000-2000	>2000	500-750	750-1250	>1250
Fluticasone	100-250	250-500	500-1000	100-200	200-500	>500
Mometasone furoate*	200-400	400-800	800-1200	100-200	200-400	>400
Triamcinolone acetonide	400-1000	1000-2000	>2000	400-800	800-1200	>1200

[†] Comparisons based on efficacy data.

[‡] Patients considered for high daily doses except for short periods should be referred to a specialist for assessment to consider alternative combinations of controllers. Maximum recommended doses are arbitrary but with prolonged use are associated with increased risk of systemic side effects.

* Approved for once-daily dosing in mild patients.

Additional Notes:

- The most important determinant of appropriate dosing is the clinician's judgment of the patient's response to therapy. The clinician must monitor the patient's response in terms of clinical control and adjust the dose accordingly. Once control of asthma is achieved, the dose of medication should be carefully titrated to the minimum dose required to maintain control, thus reducing the potential for adverse effects.
- Designation of low, medium, and high doses is provided from manufacturers' recommendations where possible. Clear demonstration of dose-response relationships is seldom provided or available. The principle is therefore to establish the minimum controlling dose in each patient, as higher doses may not be more effective and are likely to be associated with greater potential for adverse effects.
- As CFC preparations are taken from the market, medication inserts for HFA preparations should be carefully reviewed by the clinician for the equivalent correct dosage.

REFERENCE: Adapted from Global Initiative for Asthma (GINA). *Pocket Guide for Asthma Management and Prevention*. 2007. Available from <http://www.ginasthma.org>.

COPD MANAGEMENT TRACK

COPD Severity Assessment

Instructions: Once COPD is diagnosed, it should be classified as Mild, Moderate, Severe, or Very Severe based on the patient's symptoms and (post-bronchodilator) lung function. Where spirometry is not available, severity must be determined based on the patient's symptoms and the level of activity of which he or she is capable.

Chronic cough and sputum production often precede the development of airflow limitation by many years, and therefore attention to patients who have these symptoms and are at risk of COPD, but who do not yet have abnormal lung function, is important. (However, not all individuals with cough and sputum production go on to develop COPD.)

COPD Severity Assessment		
Stage	Lung Function Characteristics*	Comments
I: Mild COPD	<ul style="list-style-type: none">• FEV₁/FVC < 70%• FEV₁ ≥ 80% predicted	The patient may or may not have chronic cough and sputum production. At this stage, the patient may not be aware that his or her lung function is abnormal.
II: Moderate COPD	<ul style="list-style-type: none">• FEV₁/FVC < 70%• 50% ≤ FEV₁ < 80% predicted	Symptoms usually progress at this stage, with shortness of breath typically developing on exertion.
III: Severe COPD	<ul style="list-style-type: none">• FEV₁/FVC < 70%• 30% ≤ FEV₁ < 50% predicted	Shortness of breath typically worsens at this stage and often limits patients' daily activities. Exacerbations are especially seen beginning at this stage.
IV: Very Severe COPD	<ul style="list-style-type: none">• FEV₁/FVC < 70%• FEV₁ < 30% predicted or FEV₁ < 50% predicted plus chronic respiratory failure	At this stage, quality of life is very appreciably impaired and exacerbations may be life-threatening.

REFERENCE: Adapted from Global Initiative for Chronic Obstructive Lung Disease (GOLD). *Global Strategy for Diagnosis, Management, and Prevention of COPD*. 2007. Available from <http://www.goldcopd.org>.

*All lung function measurements are post-bronchodilator values. Spirometry measurements are evaluated by comparison with reference values based on age, height, sex, and race (use appropriate reference values, e.g., see Standardization of spirometry, 1994 update. *Am J Respir Crit Care Med* 1995;152:1107-36.).

FEV₁: forced expiratory volume in one second; FVC: forced vital capacity

Evaluation: The severity of COPD determines the treatment required; proceed to [COPD Therapy](#), page 26.

Therapy For COPD Exacerbations

COPD is often associated with exacerbations, or worsening of symptoms such as cough, sputum production, and breathlessness. The cornerstones of management of COPD exacerbations are bronchodilators, glucocorticosteroids (in some patients), and antibiotics (when a bacterial cause is suspected). Criteria for hospitalization include: marked increase in intensity of symptoms, such as sudden development of resting dyspnea; severe background COPD; onset of new physical signs, such as cyanosis or peripheral edema; failure to respond to initial treatment; significant comorbidities; newly occurring arrhythmias; diagnostic uncertainty; older age; insufficient home support. For further information on treatment of COPD exacerbations, refer to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) *Global Strategy for Diagnosis, Management, and Prevention of COPD*, available from <http://www.goldcopd.org>.

Long-Term Therapy for Stable COPD

Instructions: Therapy for COPD should follow a stepwise approach depending on the severity of the individual patient's disease; use the figure below to guide you. Dosage, side effects, and other details about medications for COPD are found on page 27. Details about rehabilitation and oxygen therapy can be found in the Global Initiative for Chronic Obstructive Lung Disease *Global Strategy for Diagnosis, Management, and Prevention of COPD*, available from <http://www.goldcopd.org>. Instructions for the use of various inhaler and spacer devices are also available online at <http://www.goldcopd.org>.

COPD Therapy*	
Stage	Treatment
I: Mild COPD	<ul style="list-style-type: none">• Avoidance of risk factors (including intensive intervention to promote smoking cessation, if relevant; for details, see Appendix, page 28)• Influenza vaccination• Add short-acting bronchodilator when needed
II: Moderate COPD	<ul style="list-style-type: none">• Add regular treatment with one or more long-acting bronchodilators when needed• Add pulmonary rehabilitation (including exercise training and nutrition counseling)
III: Severe COPD	<ul style="list-style-type: none">• Add medium- to high-dose inhaled glucocorticosteroids if repeated exacerbations (for example, three in the last three years) requiring oral glucocorticosteroids or antibiotics
IV: Very Severe COPD	<ul style="list-style-type: none">• Add long-term oxygen if chronic respiratory failure• Consider surgical referral

REFERENCE: Adapted from Global Initiative for Chronic Obstructive Lung Disease (GOLD). *Global Strategy for Diagnosis, Management, and Prevention of COPD*. 2007. Available from <http://www.goldcopd.org>.

*Consult the [COPD Medication Guide](#) (page 27) for dosage, side effects, and other details about medications for COPD.

An Inhaled Glucocorticosteroid Dosing Guide is found on page 24.

Followup and Ongoing Care: COPD is typically a slowly progressive disease; therefore, treatment generally needs to be maintained at the same level over long periods of time and “stepped up” as the patient's disease becomes more severe.

Therapy for COPD does not necessarily produce an improvement in FEV₁, although small changes may be seen in lung volume measurements such as inspiratory capacity and residual volume, which are markers of lung hyperinflation. However, such tests cannot be easily performed in primary care. Therefore, additional subjective measures such as questions about symptoms, quality of life, and exercise tolerance should be used to gauge the effectiveness of treatment.

In addition, consider whether the patient may also have asthma, which may coexist with COPD. If your clinical opinion is that this diagnosis should be investigated, proceed to the [Adult Asthma Diagnosis Track](#). Patients who are diagnosed as having both asthma and COPD should receive treatment for both diseases, e.g., regular bronchodilator treatment to alleviate the symptoms of COPD, and inhaled glucocorticosteroids to control the pulmonary inflammation of asthma.

COPD Medication Guide

Drug	Inhaler (µg)	Solution for Nebulizer (mg/ml)	Oral	Vials for Injection (mg)	Duration of Action (hours)
beta2-agonists					
Rapid-acting					
Fenoterol	100-200 (MDI)	1	0.05% (Syrup)		4-6
Salbutamol (albuterol)	100, 200 (MDI & DPI)	5	5 mg (Pill) Syrup 0.024%	0.1, 0.5	4-6
Terbutaline	400, 500 (DPI)	-	2.5, 5 (Pill)	0.2, 0.25	4-6
Long-acting					
Formoterol	4.5-12 (MDI & DPI)				12+
Salmeterol	25-50 (MDI & DPI)				12+
Anticholinergics					
Short-acting					
Ipratropium bromide	20, 40 (MDI)	0.25-0.5			6-8
Oxipropium bromide	100 (MDI)	1.5			7-9
Long-acting					
Tiotropium	18 (DPI)				24+
Combination rapid-acting beta2-agonist plus anticholinergic in one inhaler					
Fenoterol/ Ipratropium	200/80 (MDI)	1.25/0.5			6-8
Salbutamol/ Ipratropium	75/15 (MDI)	0.75/4.5			6-8
Methylxanthines					
Aminophylline			200-600 mg (Pill)	240 mg	Variable, up to 24
Theophylline (SR)			100-600 mg (Pill)		Variable, up to 24
Inhaled glucocorticosteroids					
Beclomethasone	50-400 (MDI & DPI)	0.2-0.4			
Budesonide	100, 200, 400 (DPI)	0.20, 0.25, 0.5			
Fluticasone	50-500 (MDI & DPI)	0.5/2, 2.0/2			
Triamcinolone	100 (MDI)	40		40	
Combination long-acting beta2-agonist plus glucocorticosteroid in one inhaler					
Formoterol/ Budesonide	4.5/160, 9/320 (DPI)				
Salmeterol/ Fluticasone	50/100, 250, 500 (DPI) 25/50, 125, 250 (MDI)				
Systemic glucocorticosteroids					
Prednisone			5-60 mg (Pill)		
Methylprednisolone			4, 8, 16 mg (Pill)		

REFERENCE: Adapted from Global Initiative for Chronic Obstructive Lung Disease (GOLD). *Pocket Guide for Diagnosis, Management, and Prevention of COPD*. 2007. Available from <http://www.goldcopd.org>.

MDI=metered-dose inhaler; DPI=dry powder inhaler

Appendix: Smoking Cessation

Smoking cessation is the single most effective—and cost-effective—intervention to reduce the risk of developing COPD and slow its progression. Cigarette smoke is also a trigger for asthma and allergic rhinitis symptoms, and smoking cessation is an important component of managing these diseases.

- Even a brief, 3-minute period of counseling to urge a smoker to quit can be effective, and at a minimum this should be done for every smoker at every visit. More intensive strategies increase the likelihood of sustained quitting (**Figure 4**).
- Pharmacotherapy (nicotine replacement, bupropion/nortriptyline, and/or varenicline) is recommended when counseling is not sufficient to help patients stop smoking. Special consideration should be given before using pharmacotherapy in people smoking fewer than 10 cigarettes per day, pregnant women, adolescents, and those with medical contraindications (unstable coronary artery disease, untreated peptic ulcer, and recent myocardial infarction or stroke for nicotine replacement; and history of seizures for bupropion).

Figure 4. Strategy to Help a Patient Quit Smoking
<p>1. ASK: Systematically identify all tobacco users at every visit. <i>Implement an office-wide system that ensures that, for EVERY patient at EVERY clinic visit, tobacco-use status is queried and documented.</i></p>
<p>2. ADVISE: Strongly urge all tobacco users to quit. <i>In a clear, strong, and personalized manner, urge every tobacco user to quit.</i></p>
<p>3. ASSESS: Determine willingness to make a quit attempt. <i>Ask every tobacco user if he or she is willing to make a quit attempt at this time (e.g., within the next 30 days).</i></p>
<p>4. ASSIST: Aid the patient in quitting. <i>Help the patient with a quit plan; provide practical counseling; provide intra-treatment social support; help the patient obtain extra-treatment social support; recommend use of approved pharmacotherapy if appropriate; provide supplementary materials.</i></p>
<p>5. ARRANGE: Schedule follow-up contact. <i>Schedule follow-up contact, either in person or via telephone.</i></p>

Further details about smoking cessation can be found in the Global Initiative for Chronic Obstructive Lung Disease (GOLD) *Global Strategy for Diagnosis, Management, and Prevention of COPD*, available from <http://www.goldcopd.org>.

REFERENCE: Adapted from GOLD. *Pocket Guide to COPD Diagnosis, Management, and Prevention*. 2007. Available from <http://www.goldcopd.org>.

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